

FLIGHT

First Aero Weekly in the World.

Founder and Editor: STANLEY SPOONER.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

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Flight.

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EDITORIAL COMMENT.

The Work of the Royal Naval Air Service.

In commenting in our last issue on the eulogium of the Royal Flying Corps in the official despatches of Field-Marshal Sir John French, we pointed out that while there was no official news with regard to the operations of the Royal Naval Air Service, this branch of the country's protection was none the less doing valuable work. Official proof of this is now afforded in the Memorandum issued by the Director of the Air Department, Admiralty, which, although dated October 11th, was not available to the Press until towards the end of last week.

Although the Memorandum is confined to a brief, one might say almost bald, record of the operations of the Service from September 1st to October 8th, it is evident, reading between the lines, that a vast amount of useful work was done during that period both by the aeroplane and armoured motor support of the Naval Wing. Thus, it transpires, for the first time, we believe, that in addition to the long and successful flights to Düsseldorf and Cologne, which have raised considerable, not to say hysterical alarm amongst the Germans, and the previously recorded feat of Commander Samson, they have also been engaged in numerous reconnaissances, and in a

number of skirmishes, notably at Cassel, Savy, Aniche, and Orchies. The operations were conducted from Dunkirk and Calais, Commander C. R. Samson, R.N., being in command at the first-named port, and, apparently, Squadron-Commander Spenser Grey at the latter.

Doubtless, both these officers, together with Lieut. Collet and Flight-Lieut. Marix, will feel that they were only doing their duty, but it is pleasing to note that their names appear with other flying officers among the list nominated to receive the appointment of Companion of the Distinguished Service Order and for the award of the Distinguished Service Cross in recognition of the services they have rendered.

The combined efforts of the Naval and Military Air Services in the work of preventing the enemy's advance in the North of France, are daily so apparent that we look forward with certainty to the issue of further official recognition in the near future. In the meantime, the best wishes of FLIGHT for continued success and safety go out to all who are maintaining the British reputation in the field of aviation, in both branches of the Services.

"When the Lights are Low."

Although we are now, generally speaking, becoming accustomed to the darkened London streets at night time, questions in many directions are beginning to be raised as to the utility of the plan. "Dagonet," in his notes in the *Referee*, was one of the first to sound the doubtful note, and in his usually interesting style again last week remarked, "Lights up, let 'em all come," "em" being, of course, in this case, the Zeppelins, of which we have heard so much but seen so little. In Dagonet's opinion :

"The darkening of London has flooded the hearts of the German spies in our midst with joy. For the extinguishing of lights in a coast town there is good and sufficient reason. Ships steer towards lights. They do not look down upon them from above. If Zeppelins were to come over a brightly-lighted London, they would not in the blaze of light be able from a good height to see anything but the great glare. It would be one enormous mass of illumination. But with London darkened to the point of blackness, one single ray of light would be distinctly visible against the surrounding darkness. This is why the spies rejoice. . . . By darkening London, we are really playing into the hands of the enemy."

In other quarters the view is being expressed that even if the lowering of the lights reduces the risk of damage associated with the possible visit of hostile

aircraft, any advantage in this direction is more than outweighed by the increased likelihood of accident to pedestrians and other road-users.

While there is, doubtless, much to be said against the order, we can hardly imagine that it would have been issued by the authorities except after careful consideration of all the points involved, and, in view of the fact that one or more of our military dirigibles made many night flights for observation purposes under varying conditions, it is fairly obvious that much more is known of things, as from above, by those responsible for the protection and safety of the public than the latter are aware of. It has even been suggested that the reason for reducing the street and shop lighting in London has nothing to do with reported visits of enemy airships at all, but has been enforced as an assistance in ferreting out the spies who have been, and maybe still are, making use of various means of transmitting information abroad.

Whatever the facts really are, the public may rest assured that the protection of London is being very carefully looked after, and that, should any Zeppelins venture across the North Sea, their crews will meet with a very warm reception.

“Anti-Bomb Insurance.” Reports from the City, however, show that underwriters are still busily engaged on the issue of special policies to cover the risks of any damage that may ensue from a visit of German aircraft to this country. We have already expressed the opinion that the modesty of the premiums charged, ranging as they do from 2s. 6d. per cent. in the case of private residences to 5s. for business establishments and public buildings, is in itself a measure of the small probability of an effective invasion. The fact that Lloyd’s underwriters, who are no better placed than the general public as to the extent of the risk, should be willing to accept it at such a low rate ought to carry con-

viction in the public mind. Indeed, it has been facetiously suggested to us that all such reports as that of Westminster Abbey having been insured for a quarter of a million sterling, more or less, and other public buildings for correspondingly large amounts, emanate from those who see in the public scare an opportunity for bringing in a grand total of premiums, very much under velvet cushion conditions.

For ourselves, our view of the matter, as we have already stated in a previous issue, is that, if there is any real prospect of an attempted invasion, it should be a matter for serious consideration whether the Government—which, through its various channels of information, is likely to be best informed on the subject—should not be called upon to accept responsibility for any damage that might result from such an invasion. Obviously such damage would be the direct outcome of the national conflict, and as such ought, as far as possible, to be made good by the Government. The amount of damage likely to eventuate is in any case likely to be comparatively negligible, and the moral effect upon the general public of such an effect would undoubtedly be to inspire complete confidence, and put the little army of scare-mongers into the gloomy obscurity which they deserve. Even if such a suggestion does not commend itself to the authorities, there is still another proposal they might consider, and that is, seeing that they have already taken many excellent safeguards in the public interest, notably in connection with marine insurance, in the fixing of maximum food prices, the prevention of a “corner” in sugar, &c., they should undertake the issue of war-risk policies, covering also damage from hostile aircraft, so that the many thousands of half-crowns which are now being paid over to underwriters could be diverted to the public funds as a provision against a national risk. The whole business is a national question, and not one to be left to a few cute business men out of which to make capital.

“MENTIONED IN DESPATCHES.”

THE following memorandum by the Director of the Air Department, Admiralty, regarding the work of the Royal Naval Air Service was issued in a supplement to the *London Gazette* on the 22nd inst. :—

“Commander Charles R. Samson, R.N., was in command of the Aeroplane and Armoured Motor Support of the Royal Naval Air Service (Naval Wing) at Dunkerque between the dates September 1st to October 5th.

“During this period several notable air reconnaissances were made, and skirmishes took place. Of these particular mention may be made of the aeroplane attack on September 4th on four enemy cars and forty men, on which occasion several bombs were dropped; and of the successful skirmishes at Cassel on September 4th, Savy on September 12th, Aniche on September 22nd. Orchies on September 23rd.

“On September 22nd Flight Lieut. C. H. Collet, of the Royal Naval Air Service (Naval Wing of the Royal Flying Corps), flying a Sopwith tractor biplane, made a long flight and a successful attack on the German Zeppelin airship shed at Düsseldorf. Lieut. Collet’s feat is notable—gliding down from 6,000 ft., the last 1,500 ft. in mist, he finally came in sight of the airship shed at a height of 400 ft., only a quarter of a mile away from it.

“Flight Lieut. Marix, acting under the orders of Squadron Commander Spenser Grey, carried out a successful attack on the Düsseldorf airship shed during the afternoon of October 8th. From a height of 600 ft.

he dropped two bombs on the shed, and flames 500 ft. high were seen within 30 secs. The roof of the shed was also observed to collapse. Lieut. Marix’s machine was under heavy fire from rifles and mitrailleuse, and was five times hit whilst making the attack.

“Squadron Commander Spenser Grey, whilst in charge of a flight of naval aeroplanes at Antwerp, penetrated during a three and three-quarter hours’ flight into the enemy’s country as far as Cologne on October 8th. He circled the city under fire at 600 feet, and discharged his bombs on the military railway station. Considerable damage was done.

“Oct. 11th, 1914.”

In the same Supplement was the following official announcement :—

“Admiralty, October 21st, 1914.

“The King has been graciously pleased to give orders for the following appointments to the Distinguished Service Order in respect of the undermentioned officers in recognition of their services mentioned in the foregoing despatches :—

“TO BE COMPANIONS OF THE DISTINGUISHED SERVICE ORDER.

“Commander Charles Rumney Samson.

Squadron Commander Spenser Douglas Adair Grey.

Flight Lieutenant Reginald Lennox George Marix.

Lieutenant Charles Herbert Collet, Royal Marine Artillery.”

AIRCRAFT WORK AT THE FRONT.

IN the official despatch, dated October 17th, from an eyewitness present with the British General Headquarters in France, issued by the Press Bureau on the 23rd, there were the following references to the work of aircraft :—

"In the north of France the fighting has so far been of a preparatory nature alone. As stated, ground has been gained by us, but misty weather has hampered aerial reconnaissance and has at times rendered artillery co-operation almost impossible, which factors, taken together with the nature of the terrain, have rendered progress somewhat slow."

The following extracts are taken from a supplementary despatch from "Eyewitness" issued on the 24th inst. :—

"In spite of the adverse weather the aviators of both sides have not been idle in the northern theatre of operations. To begin with, on Monday, the 12th, a German airman flew over St. Omer and dropped five bombs on to it, apparently under the impression that the place was occupied by us. As a result two women and a little girl were killed.

"On Wednesday a hostile aeroplane was brought down by rifle and machine gun fire, and both observer and pilot were captured. The pilot was decorated with the Iron Cross, which, according to his own account, had been awarded to him as being the first German to drop a bomb on Antwerp.

"On the 15th three of our aeroplanes gave chase to a

German machine. Unluckily, the one machine of ours which was faster than the enemy's met with some slight accident and had to give up the chase.

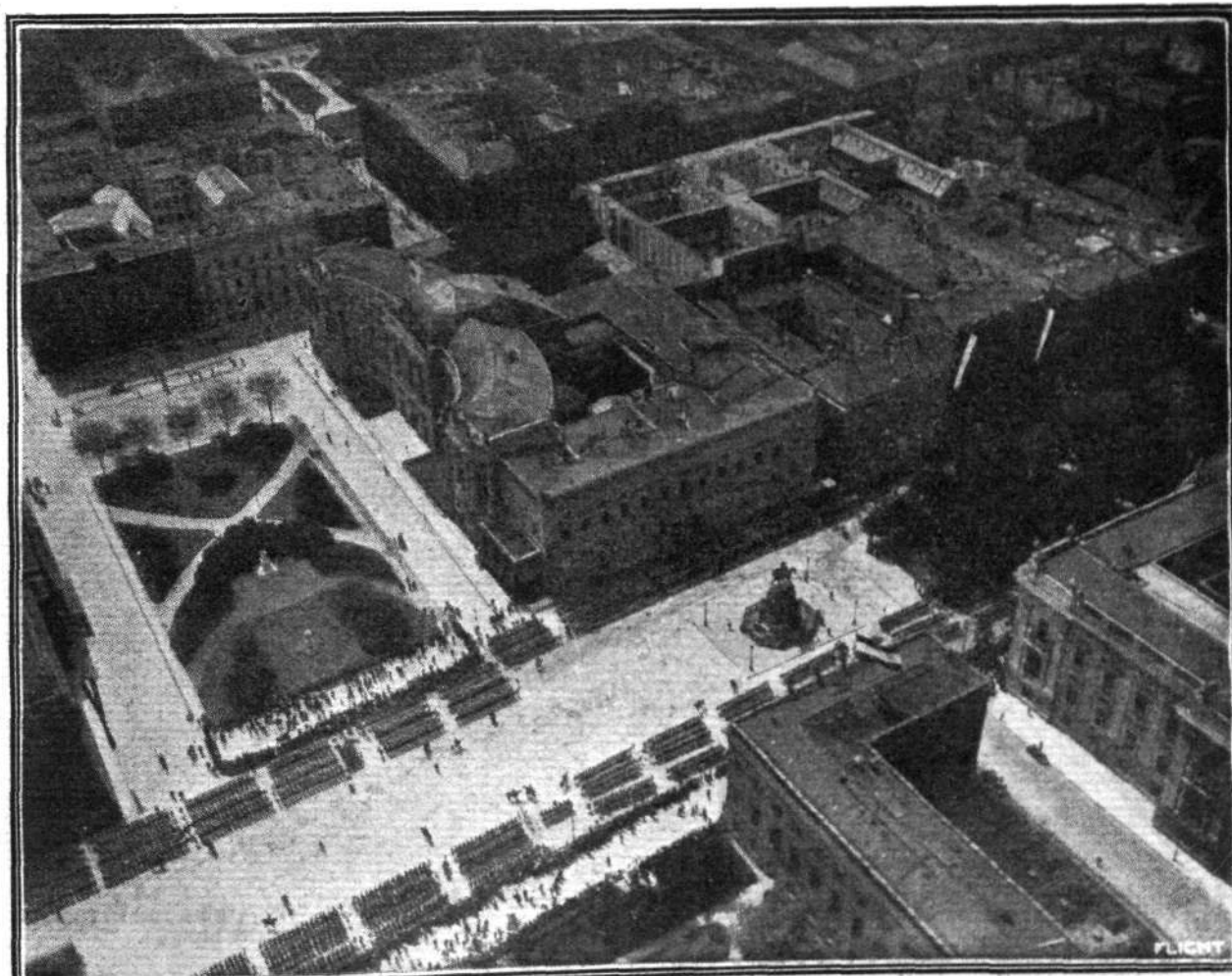
"A German airman recently made an unsuccessful attempt by means of four incendiary bombs to explode a French captive observation balloon. The missiles fell simultaneously on the circumference of a circle of about 50 yds. diameter, and as they struck the ground emitted vivid red flames, followed by columns of dark smoke about 60 ft. high. At the point where each fell was found a large mass resembling dark pumice stone, and the stubble was burnt in patches of about a yard in diameter."

The despatch also contained a translation of a leaflet, calling on French soldiers to surrender, which had been showered over the French lines by the German aviators.

In a *communiqué* issued by the Admiralty on the 22nd, regarding the work of the naval monitors off the Belgian coast, there was the following :—

"Observation is arranged from the shore by means of naval balloons, and all reports indicate that substantial losses have been inflicted upon the enemy, and that the fire is well directed and effective against his batteries and heavy guns."

In a *communiqué* issued by the Admiralty on the 24th, regarding the work of the naval guns at Nieuport and Ostend it was stated the naval aeroplanes and balloons aided in the direction of the fire.



BERLIN AS VIEWED FROM THE GERMAN DIRIGIBLE "HANSA."—A photograph of a scene which may, let us hope, be repeated under vastly different conditions when the end of the war draws nearer. The photograph is a parade of the troops in the Unter den Linden upon the occasion of the visit of the King of England to Berlin.

THE PAUL SCHMITT BIPLANE.

EVER since the early days of aviation, aeroplane designers have realised the advantages to be derived from the use of a variable angle of incidence with its complement,

Any change in the speed caused by a variation in power through the intermediary of an alteration of the angle of incidence (the flight path is assumed to be horizontal) necessitates a change in the attitude of the whole machine, which again means that the line of flight is no longer parallel to the centre line of the body. The result is that the air, instead of flowing along the top and bottom of the body and causing skin friction only, strikes it at an angle—on top at higher speeds, and on the bottom at lower speeds, and in both cases presenting a certain amount of detrimental surface.

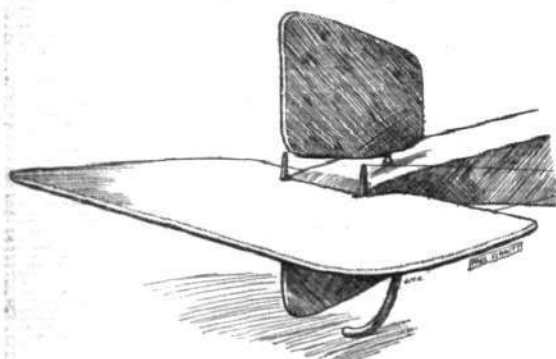
For example, suppose a machine, flying with its *fuselage* horizontal, will maintain a horizontal flight path with its engine on three-quarter throttle. Now, if the throttle is opened fully the angle of incidence will have to be diminished in order to keep the flight path horizontal, or, in other words, to prevent the machine from climbing. As the angle of incidence is fixed it can only be diminished by changing the attitude of the whole machine, that is to say, by letting it fly "tail high."

Again, for flying at low speeds the engine is throttled down, and the angle of incidence increased by letting the machine fly *cabré*—i.e., with the tail down, a position which always carries with it the possible danger of a tail slide in case of engine failure. In both cases the air, instead of causing skin friction only, exerts a pressure on the detrimental surface presented by the top or bottom of the body in the "tail high" or "tail low" position respectively. The attendant disadvantages of securing speed variation by altering the flying attitude of the machine has not been



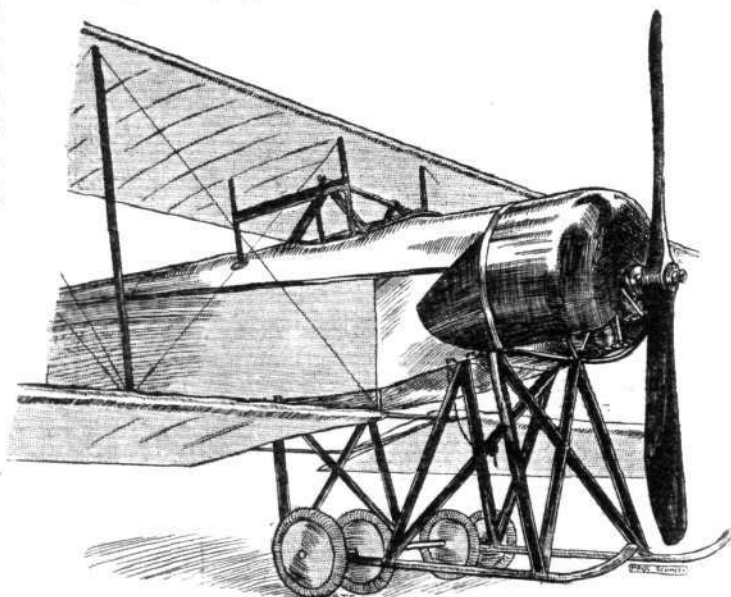
A view of the Paul Schmitt biplane in the air and of the chassis, &c.

the variation in power, when a good speed range was desired. The solution of the problem of a variable angle of incidence, however, presents certain constructional difficulties which have, no doubt, caused a great number of designers to take the line of least resistance and produce machines in which the angle of incidence remained fixed in relation to the body, but which were capable of a considerable speed variation by altering the flying attitude of the whole machine. That this method of obtaining speed variation does not and cannot give maximum efficiency throughout the entire range of speeds will be readily understood, when it is realised



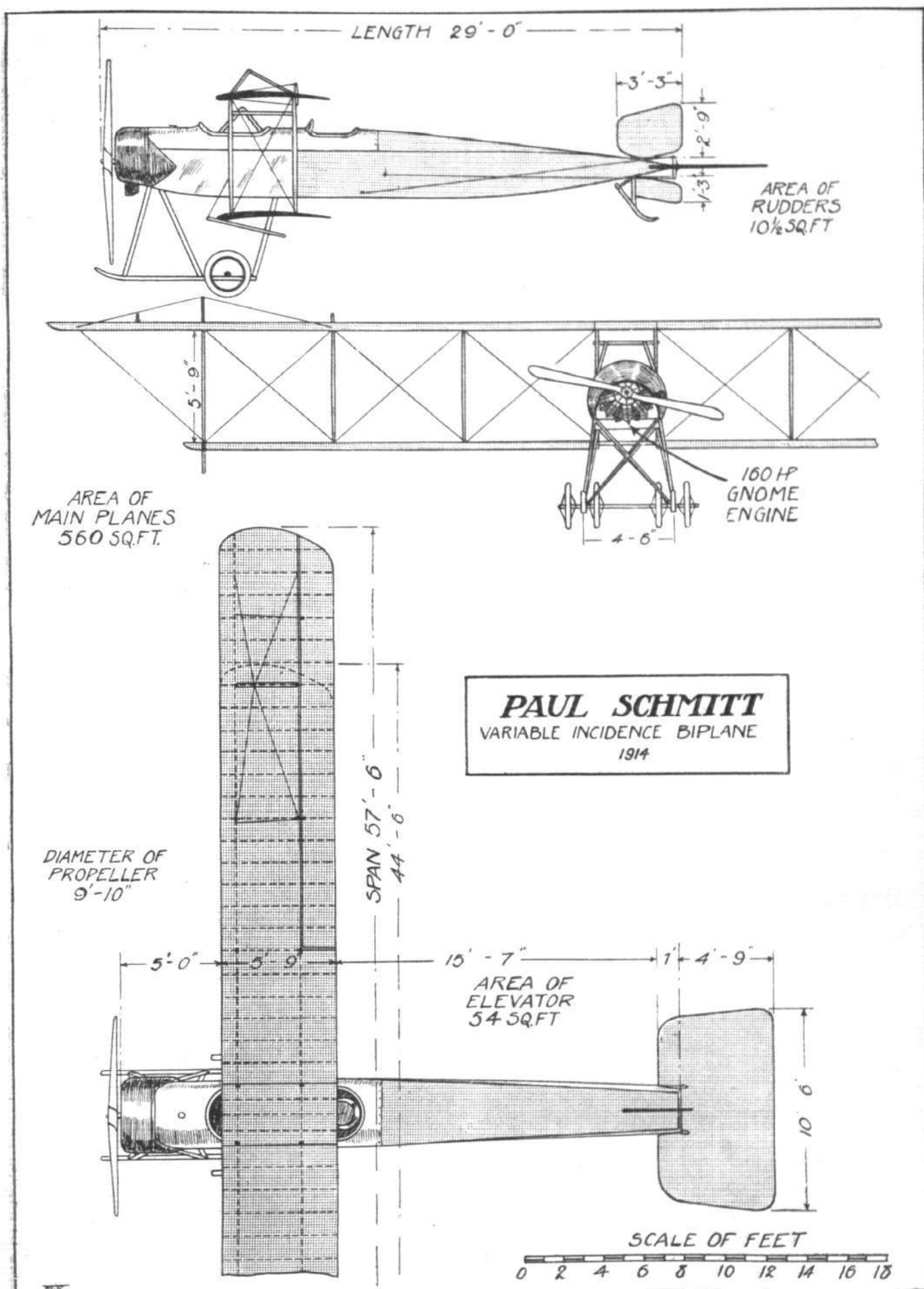
Tail planes of the Paul Schmitt biplane.

that in a machine having its wings set at a fixed angle of incidence there is only one speed at which the maximum efficiency is obtained, namely, the speed in horizontal flight at which the machine flies with its body horizontal.



Sketch showing the very substantial chassis of the Paul Schmitt biplane.

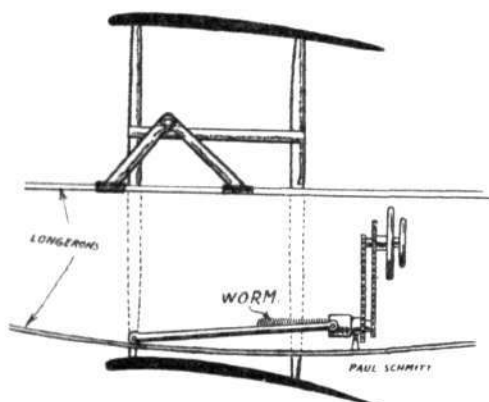
dealt with exhaustively in the above, as to do so would be outside the scope of this article, but it will give an idea of the *raison d'être* of the variable incidence machine.



THE PAUL SCHMITT BIPLANE.—Plan, side and front elevations to scale.

As already mentioned, there are certain constructional difficulties which militate against the satisfactory solution of the problem of the variable angle of incidence, but the Paul Schmitt biplane, which was exhibited at the last Paris Aero Show, and which is not, as might be inferred by its name, a German but a French production, is the most practical attempt that has yet been made to overcome the difficulties. Since the method employed of altering the angle of incidence is the most interesting feature of this machine it will be dealt with first.

From the accompanying illustrations it will be seen that the two main planes form a separate unit independent of the body, which passes between the planes without touching either of them. Attachment to the fuselage is effected by a transverse tubular shaft resting in ball bearings on the apices of two inverted V tubes, which are in turn bolted to the upper longitudinals of the body. The ends of the transverse axis are rigidly attached to two fore and aft tubes secured to the inner pair of interplane struts. These



Sketch showing method of altering the angle of incidence in the Paul Schmitt biplane.

are connected top and bottom by transverse steel tubes, and pass inside the body, running through slots in the top covering. In this way it will be seen the wings are free to rotate around the transverse axis until the inner plane struts touch some member of the body. They are prevented from doing so by a large nut working on a threaded shaft mounted longitudinally on the floor of the body. This nut is connected by two pivots to the rear pair of interplane struts. On the rear end of the longitudinal shaft are carried two concentrically mounted

sprockets from which chains pass to two hand wheels in front of the pilot. Rotation of one wheel causes the shaft to revolve slowly, whilst the other is so geared that a more rapid movement is obtained. As the shaft rotates it displaces the threaded nut in a forward or backward direction, and with it the lower ends of the interplane struts, to which it is pivoted. The amount of movement is such that the main planes swing through an arc of from 0 to 12 degrees.

By suitably varying the power the machine can be flown at speeds from 22 to 68 m.p.h., maintaining a horizontal flight path, whilst if it is desired to climb quickly, the planes are set at a large angle of incidence and the engine opened out. The number of records which this machine has to its credit are ample proof of the excellence of the design.

Apart from the variable incidence, this machine is interesting on account of the fact that it is built practically throughout of steel. The body is built up of steel tubes autogenously welded. From the nose to a point just behind the seats the body is of rectangular section, whilst to the rear of this point the lower longitudinals converge so as to form a triangular section. In the stern of the body the longitudinals are connected to a short transverse steel tube which forms a pivot for the elevator. This member is unusually large and is partly balanced, no doubt in order to make it easier for the pilot to operate, a feature which is almost a necessity in a machine in which the elevator plays such an important part in the speed variation. In the nose is mounted between double bearings the 160 h.p. Gnome engine, which is partly covered by a shield of a similar form to that employed on the Morane-Saulnier monoplanes. Behind the engine are carried the tanks, and to the rear of these is the passenger's cockpit, which is extremely roomy, and which is entered through a door motor car fashion. Still further back, and on line with the trailing edge of the planes, is the pilot's seat. In front of him are the controls, which are of the usual type, i.e., a wheel operating the ailerons and elevator, and a foot bar for the rudder.

The landing carriage, although not unduly complicated, is immensely strong, a not unnecessary requirement in a machine carrying at times a useful load of over 1,800 lbs. The accompanying sketch is self-explanatory; suffice it to say that the landing carriage is built of steel tubes throughout. The chief characteristics are: Weight, empty, 1,430 lbs.; area, 480 sq. ft.; minimum speed, 22 m.p.h.; maximum speed, 68 m.p.h.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Aviators' Certificates.

THE following Aviators' Certificates have been granted:—

- 942 Flight Sub-Lieut. John Joseph Petre, R.N.A.S. (E.A.C. Biplane, Eastbourne School, Eastbourne). Oct. 14th, 1914.
- 943 Alexander Burnell Rendall (Maurice Farman Biplane, Military School, Brooklands). Oct. 19th, 1914.
- 944 2nd Lieut. Cecil Harloven Saunders, R.F.C. (Maurice Farman Biplane, Central Flying School, Upavon). Oct. 21st, 1914.
- 945 Flight Sub-Lieut. Arthur Ethelbert Griffin, R.N.A.S. (Maurice Farman Biplane, Central Flying School, Upavon). Oct. 21st, 1914.

Appointments to the Distinguished Service Order.

The King has been graciously pleased to appoint the following Members of the Royal Aero Club Companions of the Distinguished Service Order, and to award them the Distinguished Service Cross, in recognition of their services in the War:—

Commander C. R. Samson, R.N.A.S.

Squadron Commander Spenser D. A. Grey, R.N.A.S.

Flight-Lieut. R. L. G. Marix, R.N.A.S.

New Members.

Members are reminded that according to the Rules, the Annual Subscription of any New Member they may propose, who is elected between November 1st and December 31st of this year, will cover the period up to December 31st, 1915.

Royal Aero Club Burgee.

Burgees, embodying the design recently approved by His Majesty the King, namely the Royal Crown with the Caduceus, can now be obtained by Members from the Royal Aero Club, price 6s. each.

B. STEVENSON, Assistant Secretary.

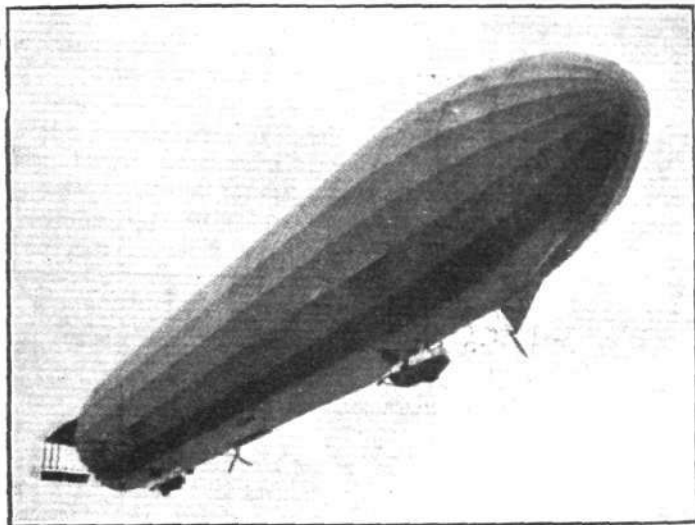
166, Piccadilly, W.

GERMANY'S AIRSHIPS.

(Continued from page 1057.)

HAVING last week described briefly the four classes of airships in use by the German authorities, a short historical review dealing with each series may be given. It will show how, from year to year, the size as well as the number of airships turned out by each factory has increased. Incidentally this also gives an idea of the output in time of peace, from which it is possible to form an estimate of the probable number which might be constructed under stress as in the present emergency. In

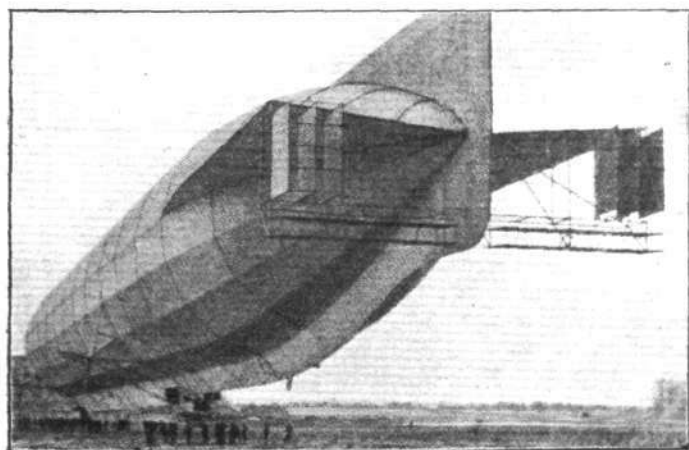
existence for a few months only L.Z.2 came to grief at Kislegg, where it was so badly damaged in landing that repairs were out of the question. Nothing daunted, Count Zeppelin commenced the construction of a third



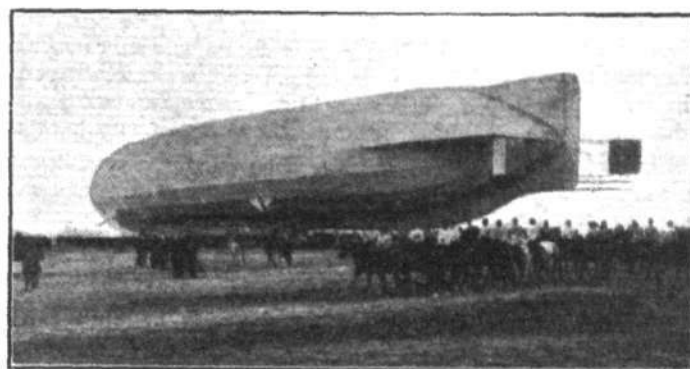
10. The Army Airship Z. VI.

view of prominence accorded to the doings of the Zeppelin type they will be dealt with first.

It was in 1900 that Count Zeppelin completed his first dirigible, which had been constructed in a floating shed on the Lake Constance. The L.Z.1 was 420 ft. long, and had a capacity of 400,000 cu. ft. After several trials of varying duration, during which alterations and improvements suggested themselves, and were effected, this airship was dismantled in the spring of the following year. A series of experiments was then commenced, the object of which was to provide data for the next dirigible to be built. This was completed in 1905, and although as regards dimensions it was identical with L.Z.1, it had incorporated in it numerous detail improvements. A number of trial trips were made, but after being in



12. The Army Airship Z. I.

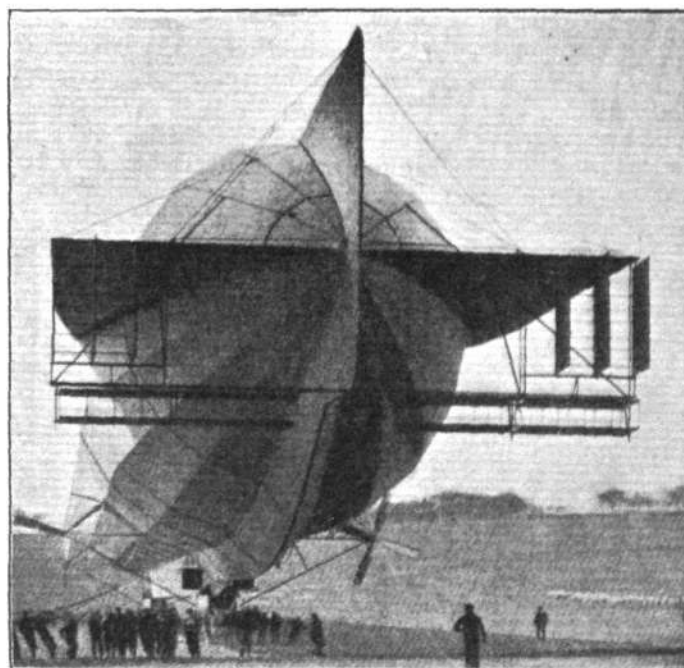


13. The Army Airship Z. IV.

airship, the L.Z.3, which was, as far as dimensions are concerned, a sister ship to the two previous ones. This was purchased by the Prussian War Office, and given the official Army number Z. I.

During a number of cruises carried out in 1906 valuable experience was gained, which led to dismantling and reconstruction in the following year. Apart from detail innovations the chief alteration effected was the lengthening of the hull by some 25 feet.

As soon as the work of reconstructing Z. I was completed a new ship was put in hand. This, which carried the shop number L.Z.4, was considerably larger than any of the previous ones, being 446 ft. long, and having a cubic capacity of 532,000 cu. ft. A series of trials were

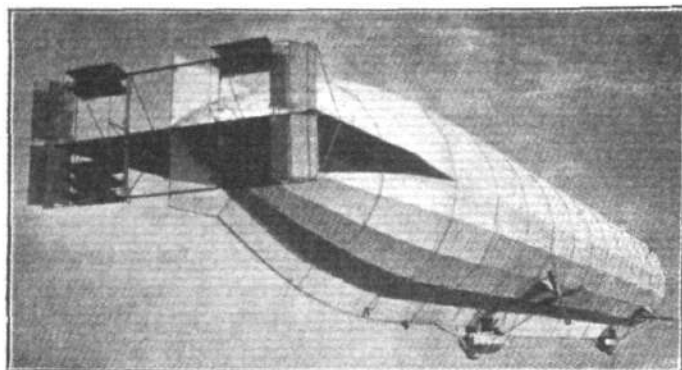


14. The Army Airship Z. III.

carried out, but misfortune also overtook this dirigible, which was wrecked near Echterdingen on August 5th, 1908, before it had been taken over by the Government. A sister ship was constructed, and made its appearance

the following year, when it was acquired by the Prussian War Office. Concurrently with usual practice this airship, which carried the shop number L.Z.5, was given the military number Z.II. A considerable amount of work was done with this ship before it finally came to grief in April, 1910, being wrecked in a gale near Weilburg.

Another similar vessel was completed in 1909, but in view of several defects it was dismantled and considerably altered, among other things being lengthened from 446 ft. to 473 ft., while the cubic capacity increased from 532,000 cu. ft. to 570,000 cu. ft. This was destroyed in its shed, at Oos, Baden, by fire on September 14th the following year before it had passed out of the hands of the builders. From this it is apparent that the output



15. The Army Airship Z.II.

of the Zeppelin works for 1909 had increased from one a year to two complete airships and reconstruction of one of them.

The next to make its appearance was the L.Z.7, which was finished in 1910. In general arrangement this Zeppelin was similar to previous ones, but its length was 485 ft., and it had a cubic capacity of 685,000 cu. ft. It was sold to the Delag firm (Deutsche-Luftschiffahrts-Aktien-Gesellschaft), who christened it the "Deutschland" and inaugurated a passenger service, which, however, came to an end when the "Deutschland" was caught in a gale and wrecked in the Teutoburger Woods on June 28th, 1910. To replace this a sister ship, the L.Z.8, was completed early in 1911, and was purchased by the Delag firm, who gave it the name "Deutschland." It had not long been in service, however, before it was



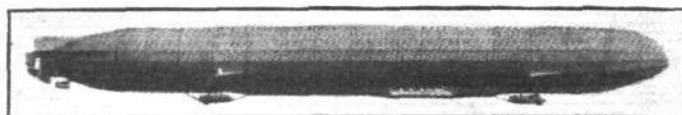
20. The Zeppelin Airship "Sachsen."

wrecked by fouling a portion of its shed at Düsseldorf when being taken out for a voyage.

Two more Zeppelins were completed in 1911, the L.Z.9 and the L.Z.10, of which the former was sold to the Prussian War Office, being given the official number Z.II, to replace the one lost at Weilburg, while the latter was purchased by the Delag firm and became the "Schwaben." Each of these had a capacity of 631,000 cu. ft. Again the Delag firm were pursued by misfortune, and lost the "Schwaben," which was wrecked by fire in its shed at Düsseldorf, on June 28th, 1912.

In 1911 the keel was laid for a new airship, the L.Z.II, which was not, however, finished until the beginning of the following year. L.Z.II had a length of 485 ft. and a capacity of 664,000 cu. ft. In spite of the loss of the first three dirigibles purchased, the Delag firm bought the L.Z.II, which was later known as the "Viktoria Luise," and succeeded, partly, no doubt, owing to improvements effected in the ship itself and partly in consequence of the experience gained with the handling of previous ships, in doing a great amount of passenger carrying without meeting with any serious mishaps. The "Viktoria Luise" has, as was mentioned in our article in last week's issue, now been taken over by the Imperial Navy.

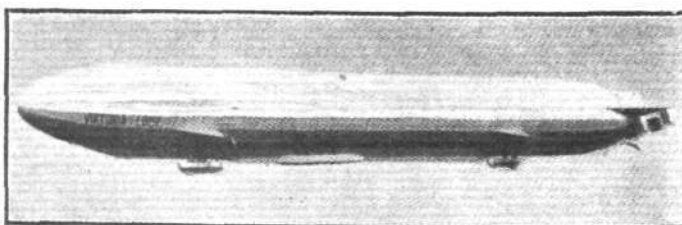
The L.Z.12, work on which was commenced in 1911, but which did not take the air until the following year, had a capacity of 620,000 cu. ft., and was 460 ft. long. It was purchased by the Prussian War Office, and appeared in our table in last week's issue under the name Z.III. Two more ships were completed in 1912: the L.Z.13, which was a sister ship of the "Viktoria Luise," was sold to the Delag firm, and given the name



21. The Zeppelin Airship "Hansa."

"Hansa," and the L.Z.14, which was a much larger ship, having a capacity of 800,000 cu. ft. and a length of 518 ft. The latter named was sold to the Imperial Navy, and particulars of it will be found in the table under the name L.I in the list of naval airships. It was wrecked in a storm near Heligoland on September 9th last year. The "Hansa," which has done a great amount of passenger carrying, among other voyages being one to Copenhagen, Denmark, is, so far as one can ascertain, still in existence, and has also been taken over by the Navy.

From the rate of two to three airships a year the output in 1913 was increased to eight. The first of these, the L.Z.15, was 463 ft. long and had a capacity of 690,000 cu. ft. It was purchased by the Prussian War Office, and given the name of Ersatz Z.I to take the place of the original Z.I. Its life, however, was a short one, as it was wrecked at Karlsruhe on March 19th last



22. The Zeppelin Airship "Viktoria Luise."

year. A sister ship, the L.Z.16, was also sold to the Prussian War Office, and particulars of it will be found in our table under the name Z. IV.

Another sister ship, the L.Z.17, was sold to the Delag firm, and is known as the "Sachsen." This also is included in our table, and is now being used by the Imperial Navy. Next followed the largest airship turned out by the Zeppelin firm up to the end of last year, the L.Z.18, which was 520 ft. long, and had a capacity of 960,000 cu. ft. It was sold to the Navy, who had just taken it over when it caught fire in the air and was totally

destroyed at Johannisthal on October 17th of last year. This naval airship was known as the L.II.

The L.Z.19, which is a sister ship of the L.Zs. 15, 16 and 17, was purchased by the Prussian War Office and is, we believe, still in existence as the Z.I. This, it will be seen, makes the third Z.I, having taken the place of the ill-fated Ersatz Z.I which was wrecked at Karlsruhe. Two similar airships, the L.Z.20 and the L.Z. 21, were also sold to the Prussian War Office, and carried the official number Z.V and Z.VI. Of these the Z.V has been reported captured by the Russians in September this year.

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FROM THE BRITISH FLYING GROUNDS.

Royal Aero Club Eastchurch Flying Grounds.

THERE was quite a lot of flying last week, especially in the early part. The undermentioned machines took part, chiefly instructional and bomb-dropping:—Bristol tractor, Sopwith, Vickers and Shorts gun 'bus, 2 Maurice Farmans, Deperdussin, Short sociable, and 3 other Short pushers. A naval airship passed to and from the coast on Saturday.

Mr. Leo Jezzi was out on Saturday evening on his 35 h.p. Jap own make tractor.

Brighton-Shoreham Aerodrome.

Pashley Bros. and Hale School.—Cole, Sibley and Babiotis up with instructor; Morrison, Winchester and Woodhouse, circuits and eights. Instructors for the week, E. and C. Pashley and F. Hale. Last week Mr. Woodhouse returned from Belgium, where he had been driving an armoured car in connection with the Naval Air Service.



Flight Sub-Lieut. E. R. Moon, R.N.A.S. Two recent pilots who have secured their *brevets* on Mr. Prosser's Caudron biplane at Hendon aerodrome.

The last to emanate from the Zeppelin works in 1913 was the L.Z.22, military number Z.VII, which had a capacity of 780,000 cu. ft. and a length of 512 ft. The airship Z.VIII, brought down by the French at Badonviller in August this year, was the L.Z.23, built in 1914, whilst the L.Z.24 is the Naval airship L.III. In addition to the airships enumerated above, there are undoubtedly several others which have been completed since the beginning of this year, but regarding which no definite information is available, although it was stated a week or so ago that L.Z.26 was being tested over Lake Constance.

(To be continued.)

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—Weather on Monday and Tuesday last week too windy for flying, pupils receiving instruction in the hangars.

Wednesday, Prob. Flight Sub-Lieuts. Allen and England and Messrs. Carabajal and Easter landing practice, circuits, eights, &c., &c. Prob. Flight Sub-Lieuts. Bray, Groves, Hodsoll and Watson, and Messrs. Greenwood and Y. Y. Liu straights with Instructors Manton, Russell, Winter and Shepherd. Prob. Flight Sub-Lieuts. Barnes and Cooper (new pupils) rolling with instructor and passenger flight. Prob. Flight Sub-Lieut. Field and Mr. Stalker solo straights Mr. Morgan solo circuits and eights.

Thursday, Prob. Flight Sub-Lieut. Groves straights with Instructor Shepherd, but no further flying practice owing to high winds.

Friday, Prob. Flight Sub-Lieut. Allen passed *brevet* tests in very good style, gaining certificate. Prob. Flight Sub-Lieut. England passed *brevet* tests A and B, but too dark to go in for the third test.



Photos. by F. N. Birkett.

Mr. P. Legh.



Photo. by F. N. Birkett.

Another pilot, Mr. T. W. Abbott, who has secured his ticket on Mr. Prosser's Caudron biplane at Hendon.

Beatty School.—Last week, pupils being instructed on "dual" controlled biplanes. Instructors: Mr. Geo. W. Beatty and W. Roche-Kelly. During the week the following pupils received instruction: Messrs. Leong, Virgilio, Gardner, Aoyang, Parker, Whitehead, Jenkinson,

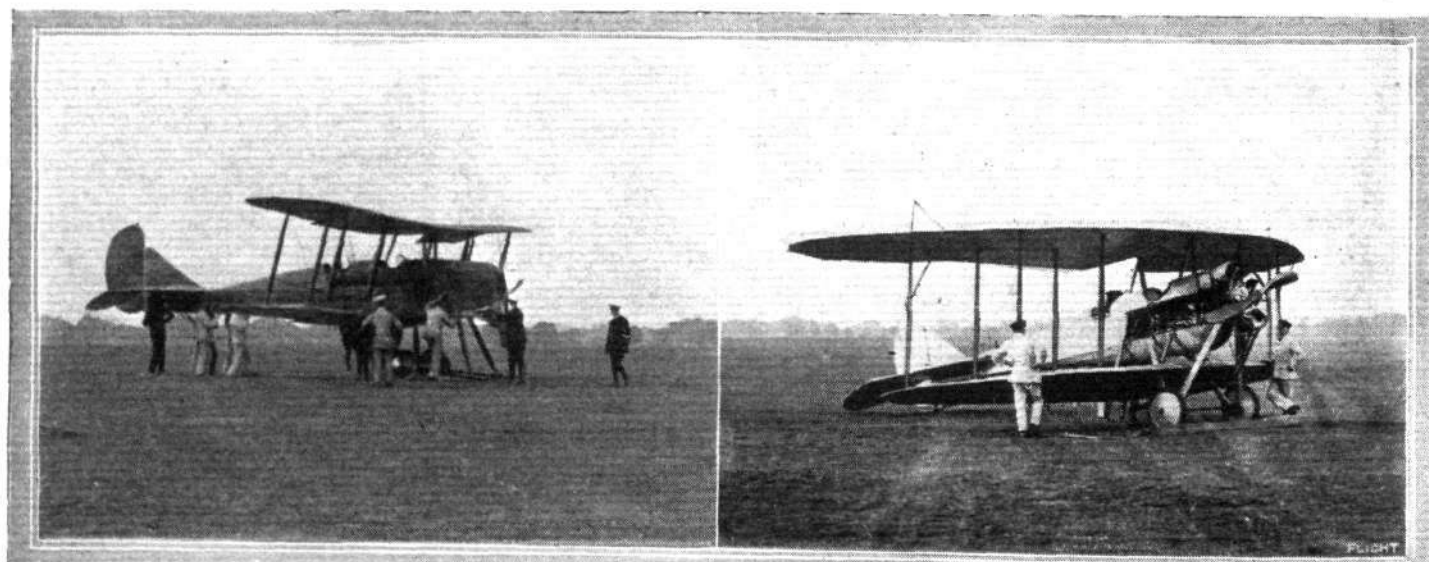
Leeston-Smith, Beard, Beynon, Moore, Newberry, Anstey Chave, Christie, Donald, and Wainwright.

British Caudron School.—Monday and Tuesday last week, very windy. Wednesday, school out at 6.30 a.m. Instructors during week, R. Desoutter and R. Murray. R. Desoutter test flight on new 35 h.p. machine. Sub-Lieuts. Bird and Tench rolling. Mr. Beynon also rolling practice. Dr. Christie and Mr. Barfield doing straights. Mr. Ivermee good circuits. Evening, Mr. Ivermee circuits. Dr. Christie circuits. Sub-Lieuts. Bird and Tench and Mr. Williams (new pupil) rolling. Messrs. Barfield and Stevens straights. Passenger flights on "60" to Messrs. Ivermee, Williams and Hatheway. Thursday, very wet.

Friday, morning windy. Evening, Mr. Ivermee circuits. Mr. Bransby Williams, Jnr., rolling practice. Mr. Stevens straights. Test flights by R. Desoutter and R. M. Murray. Saturday, windy.

Sunday morning, school out 7.45 a.m. to 12.30 p.m. Instructor, R. Desoutter. Test flight by R. Desoutter. Sub-Lieuts. Bird and Tench rolling straights. Mr. Ivermee circuits. Messrs. Barfield, Beynon and Christie good straights. Mr. Williams rolling, good progress.

Hall School.—Monday, last week, in morning and evening, gale. Tuesday, ditto. J. L. Hall two circuits on *brevet* tractor. Wednesday, too windy for pupils. J. L. Hall half-hour on No. 1 Caudron. Thursday, very windy. Friday, in spite of wind, J. Rose put in 6 mins. flight on *brevet* tractor. Saturday, Lloyd Williams (new pupil), in morning, ten good straights, handling machine in splendid style for a beginner. J. L. Hall in meantime for circuits on *brevet* machine in dense fog. Later, J. Lloyd Williams did another twenty-eight straights, improving rapidly. Amelie Cini four straights during course of day. Sunday, in morning, J. L. Hall instructing. J. Lloyd Williams twelve straights, including some hops, before rain finally put an end to proceedings. Earlier the Climax Film Producing Co. took some excellent films.



QUALIFYING FOR ROYAL AIR SERVICE AT HENDON.—On the left an R.E. just about to make a flight, on the right an Anzani-engined Handley-Page in waiting.

The Royal Aero Club Year Book.

THE new edition of the Royal Aero Club year book, which has just been issued, besides continuing the old features which have rendered it such a useful compilation, now includes one or two additions. Thus there is a list of

the fatalities which have occurred up to June last, the particulars given including the names of those involved, the place where the accident occurred, and the make of the machine. Two little maps indicating the prohibited areas in England and Scotland, together with the prescribed landing places, are also given.

THE BEATTY ENGINES.

AEROPLANE engine designers in this country have recently had an accession to their ranks in the person of Mr. Geo. Beatty, of the Beatty Flying School, who has just completed the designs for two engines, one of 40-45 h.p. and the other of 80-90 h.p., reference to which was made in these columns some weeks back. Such a development is deserving of encouragement; because, although we now have several manufacturers whose products have an established reputation in this class of work, which has only been gained after long and tedious effort owing to the peculiar difficulties that must be encountered in the evolution of a reliable, light and powerful engine, any

departs from usual practice in that it is made solid throughout, as Mr. Beatty considers that he will obtain greater rigidity by this means than by using a hollow shaft. This crankshaft is supported in bearings, which are solid with the bottom portion of an exceptionally substantial one-piece crank-case, at the ends of which are two large holes, giving access to the interior. These openings are closed by aluminium covers that come close up to the shaft outside the end bearings, thus preventing leakage of oil and the ingress of dirt. Each crank works in a separate compartment, the oil level in which is maintained by oil pumps of ample capacity—overflow

passages leading from the interior of the crank-chamber to an oil sump, which is attached to the case by screws, being provided. Access to the bearings and other parts within the crank-case for examination or adjustment can be obtained, in the case of the vertical engine, through a large door on one side, which extends for the full length of the engine. All white metal bearings are made of die-cast metal.

The camshaft, magneto and water pump driving gears are arranged on the front end of the crankcase. On the vertical motor, the magneto is fixed to a bracket on the side of the crankcase; while, on the other engine, it is placed in the vee between the cylinders and above the camshaft. The water pump on both engines is of the vane type, and its details are shown in Fig. 3. The oil and petrol pumps are, however, of the gear type, and are driven by worm gearing off the camshaft. These pumps are arranged one on each side of the camshaft, and are in duplicate on the vee engine. The construction of the petrol pumps may be seen from an examination of Fig. 3; but the oil pumps are of somewhat similar design, excepting that the special control rod, A, and the casing within which it moves are unnecessary for this auxiliary, and are therefore omitted.

Quite a special feature of these engines is the system of carburation and the means provided for controlling the speed of revolution and the power output. There is no carburettor of the familiar type, but the air is carburetted by injecting the requisite quantity of fuel into the air passing through the inlet piping—the discharge from the petrol pumps previously mentioned being regulated as necessary. The method of controlling the engine will be described in reference to the vee motor, as this is the more interesting. The petrol pumps

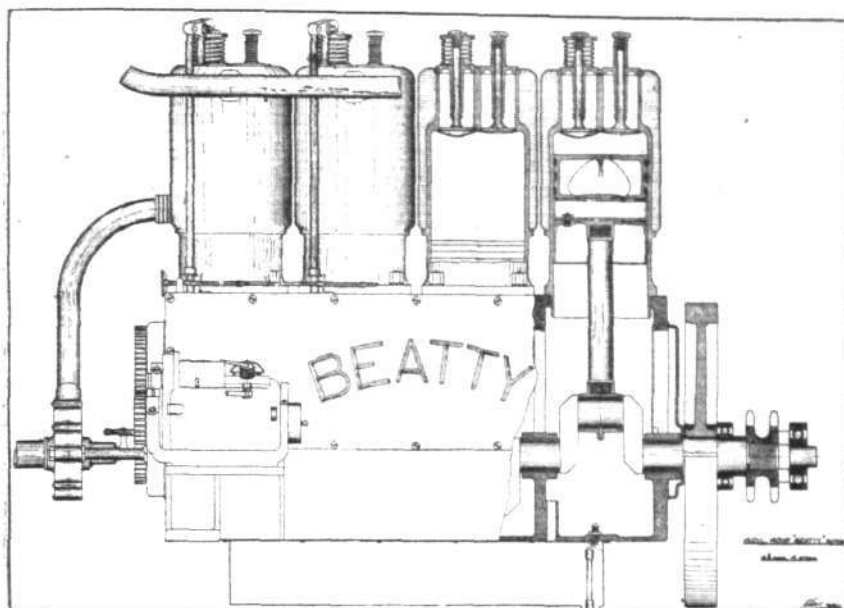


Fig. 1.—Sectional elevation of the 40-45 h.p. Beatty engine.

real attempt to make further progress by one who has been so long associated with the practical side of aviation is of wide-spread interest, especially as the design embodies several points that Mr. Beatty's experience as a pilot has led him to regard as desirable. Both engines are, we understand, nearing completion, and we shall look forward to hearing of them installed on machines at Hendon shortly.

The smaller model is a four-cylinder vertical motor; while the more powerful engine is of the eight-cylinder vee type, both engines developing their rated horse-power at a speed of 1,450 revs. per min., the bore and stroke of each being $4\frac{3}{8}$ ins. and 4 ins. respectively.

So far as the general detail construction is concerned, the engines are somewhat similar. The cylinders, which, like the pistons, are of hard close-grained cast iron, have electrolytically deposited copper jackets, and are well spigoted and secured to the aluminium crank-case by four bolts. The valves are of the overhead type—the inlet being automatic, while the exhaust valves are operated from the camshaft through rocking levers, push rods and pressed steel tappet levers inside the crank-case. The supports for the rocking levers are of special construction, with the object of rendering frequent attention for oiling unnecessary. The bush (see Fig. 4) has a groove formed in its outer circumference, within which some absorbent material is placed, and from which holes are drilled at various points leading to the pin that constitutes the fulcrum of the lever. By this means, oil is retained in the bearing for a considerable period, and is continually fed as may be required. The exhaust valve is formed by screwing and riveting a tungsten steel stem in a cast-iron head, a practice which is fairly common, and has been found to give highly satisfactory results, in America. Valve lifters, for the purpose of retaining the exhaust valves in the open position, are fitted to both engines, and are seen in the general arrangement of the smaller engine, on the top of the crank-case.

The connecting-rods of the vertical engine embody a somewhat unusual construction, in that the two ends are of phosphor-bronze screwed on to a nickel-steel tubular rod. The connecting-rods of the vee engine are, however, of H section nickel. The crankshaft

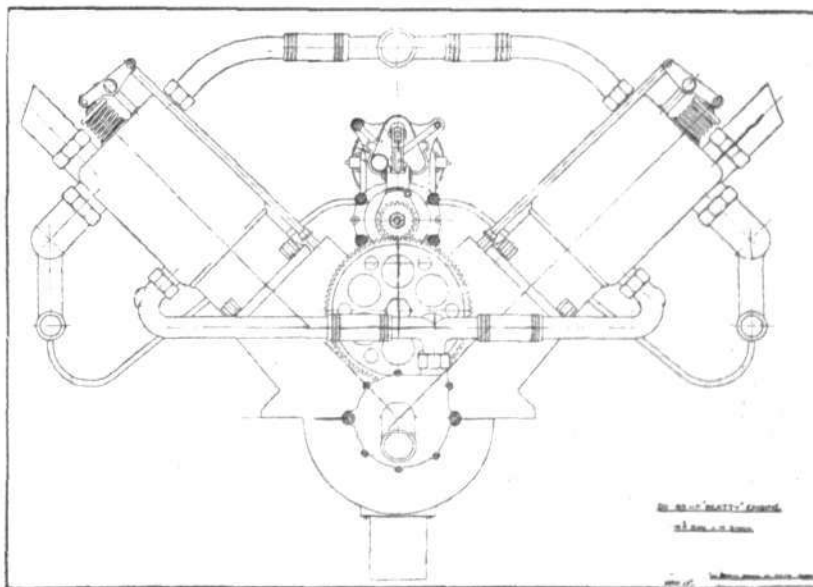


Fig. 2.—End elevation of the 80-90 h.p. vee Beatty engine.

on this engine are arranged on one side of the camshaft, and are coupled together and to the control lever by the rod, A (Fig. 3), through which holes are drilled in suitable positions to register with the discharge passages from the pumps. The engine control lever is also inter-connected with the magneto, which is of a special type, with a 60° advance, and with the exhaust-valve lifters.

This lever is mounted upon an arc of approximately 180° , divided into three equal divisions of about 60° each. When the control lever is at, or near, one end of the arc, the ignition is fully advanced, and the full quantity of fuel is taken by both sets of four cylinders on each side, which are then working at full power. By moving the lever through the first 60° , the time of ignition is fully retarded—further movement cuts out the fuel supply to the set of cylinders on one side, and by the time the end of the second 60° is reached, the exhaust valves of that set are lifted and the ignition is switched off, thus causing the engine to be driven by one set of

machines fitted with twin chain-driven air screws; but designs have been prepared for enabling the air screws to be mounted directly upon the end of the crankshaft, in which event double ball thrust bearings will also be incorporated in the crank-case itself.

The weight of the four-cylinder engine is 180 lbs., and that of the eight-cylinder 280 lbs., complete with flywheel; and Mr. Beatty is prepared to accept orders for either of these engines at a price of £250 and £375 respectively. Every care has been taken in getting out the designs to make the construction as simple as possible, consistent with efficiency and accessibility; and in the manufacture

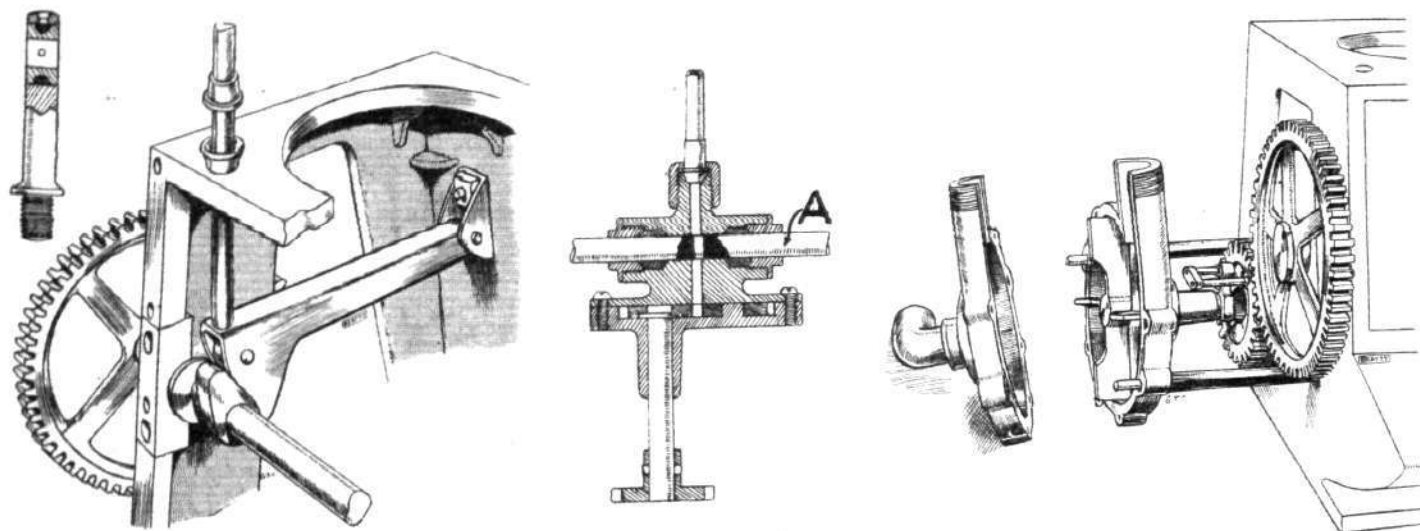


Fig. 3.—Beatty Aero Engine Details.—On the left, the tappet mechanism of the 40-45 h.p. motor; in the centre, a sectional view of the petrol pump of the 80-90 h.p. engine; and on the right, the water circulating pump and its driving gear of the 40-45 h.p. engine. In the extreme left top corner is seen the valve-rocking lever support on the Beatty aero engines.

cylinders running with a retarded spark. On completing the movement of the lever, the fuel supply to the remaining set of cylinders and the ignition for those cylinders is cut out, and the exhaust valves are raised, so that the crankshaft revolves freely with the exhaust valves open. By this means, it is anticipated that a considerable variation in the power output will be obtained.

The engines shown in our illustrations are arranged for use on

none but the best materials have been employed, while all parts are made to jigs and gauges to facilitate the supply of spare parts and ensure interchangeability throughout. The manufacture of the various details has been placed in the hands of firms who are specialists in the particular class of work to ensure the workmanship being well up to standard practice; but the erection and assembling are done at the Beatty School at Hendon.



THE BRITISH AIR SERVICES.

Royal Naval Air Service.

THE following promotion was announced by the Admiralty on the 26th inst. :—

Flight Sub-Lieut. G. Dyott, promoted to Acting Flight Lieutenant, with seniority of October 22nd.

The following was announced by the Admiralty on the 27th inst. :—

Probationary Flight Sub-Lieut. R. J. F. Tench, to the "Pembroke," additional, for duty with Royal Naval Air Service. To date October 5th.

The following was announced by the Admiralty on the 28th inst. :—

Temporary Sub-Lieut. F. Brook to the "Pembroke," additional, for duty with Naval Air Service, temporarily, to date October 24th.

Royal Flying Corps (Military Wing).

The following was announced in a supplement to the *London Gazette* issued on the 21st inst. :—

George C. N. Nicholson to be Second Lieutenant (on probation). October 21st, 1914.

The following was announced in a supplement to the *London Gazette* issued on the 25th inst. :—

Second Lieutenant Richard K. O. Paterson is confirmed in his rank.

The following was announced in the *London Gazette* of the 27th inst. :—

Lieut. Frank B. Binney, Royal Artillery, from the Reserve, to be a Flying Officer, and to be seconded. Dated August 31st, 1914.

Central Flying School.

The following was announced in a supplement to the *London Gazette* issued on the 26th inst. :—

Capt. Francis F. Waldron, 19th (Queen Alexandra's Own Royal) Hussars, a Flight Commander, Military Wing, to be an Instructor, *vice* Capt. A. C. H. MacLean, Royal Scots (Lothian Regt.). October 17th, 1914.



FOR ADMIRALTY REQUIREMENTS.—A consignment of Cellon dope leaving the works for delivery under an Admiralty contract.

THE OKILL PRESSURE INDICATOR.

AN INSTRUMENT FOR USE IN TUNING UP AERONAUTICAL ENGINES.

ALTHOUGH the importance of obtaining the highest possible efficiency and the maximum power output from engines used on aircraft is generally recognised, it is somewhat remarkable that instruments which will facilitate their attainment are comparatively few in number, and some of these are more or less unsuitable for general service in a works owing to their liability to derangement, the difficulty of applying them to an engine, or the necessity of expert manipulation in order that the results obtained may be of any service.

A simple device which does not suffer in these respects is the Okill Pressure Indicator, which has already been extensively employed with highly satisfactory results in testing motor car engines, for ascertaining the compression and explosion pressures in the cylinders. Hence it is probable that its use will become most universal for tuning up engines with stationary cylinders, when its usefulness in that direction is more widely known.

The Okill indicator is used by the engine builder to check the running compression pressure against the calculated value, and to ascertain whether or not the compression is uniform in all cylinders; and it may be utilised with the same objects in view by aeronautical engineers. A lower compression pressure than the designed value means a reduced power output and low efficiency, and may be due to incorrect valve timing, leaky valves or unequal distribution of gas to the cylinders. These defects can be determined most accurately and expeditiously by direct pressure measurements at various crankshaft speeds by such an instrument as the Okill indicator. Low power output may be due to either a bad compression, in one or more cylinders, or defective ignition, and if the compression is found to be satisfactory on test, we may generally conclude that the latter is at fault, but confirmation of this conclusion may be obtained by finding the pressure attained at ignition with the aid of the Okill indicator. Uniformity of compression in all cylinders is desirable, because, if the compression varies, the explosion pressure and the work done in each cylinder will also vary; and, therefore, there will be greater variation in the turning moment on the crankshaft, and more vibration throughout the structure of the machine. If the true running compression pressure in each cylinder of an engine is known, it is possible to ascertain, either directly or by deduction, in what respect, if any, the engine is defective or susceptible to improvement, which is halfway towards the elimination of any defect which may exist.

A common but deceptive and inaccurate method of testing the compression pressure is to screw an ordinary pressure gauge into the sparking-plug hole, and then crank the engine slowly round by hand, noting the maximum reading of the index finger on the dial of the gauge.

If the engine is cranked slowly, assuming the piston and valves to be absolutely tight, the pressure registered will be practically that of isothermal compression, which, of course, is not the condition of compression when the engine is running at normal speed and temperature comes into effect. If, however, the engine is running at speed, the gas is compressed adiabatically, and the pressure is, therefore, higher.

Again, piston rings and valves are never absolutely tight, thus the pressure registered on the gauge will vary with the speed of cranking, being higher or lower according as the compressed charge has a shorter or longer time to leak away.

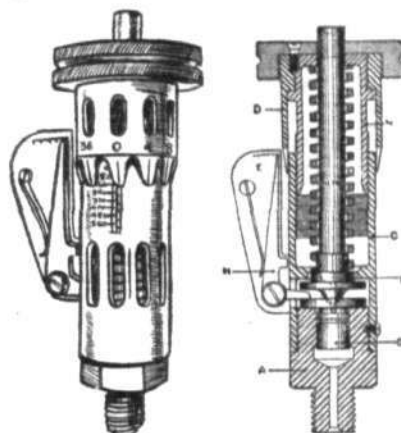
Any attempt to measure the compression pressure with an ordinary pressure gauge and the engine running at even a slow speed fails because of the inertia of the gauge parts, the gauge being rapidly destroyed if its parts are allowed perfect freedom of motion. The Okill indicator, however, may be used on engines running at the highest speeds, the principle of the instrument being such that at the instant of taking the pressure reading the working parts are at rest; obviously, then, errors due to inertia of the mechanical parts are non-existent.

For those who are not familiar with the Okill indicator the following description may be of interest:—

The illustrations show the indicator in outside and sectional elevations; it is cylindrical in form, the actual size of the petrol

engine type being approximately $1\frac{1}{2}$ ins. diameter by 6 ins. long. The construction and action are as follows:—At the base of the indicator, A, is a gunmetal cylinder; this is in communication with the engine cylinder through a small hole. The base is screwed externally with spark-plug thread, but any convenient connection may be adapted that allows of a hole of $\frac{1}{16}$ in. diameter or more between the engine cylinder and the cylinder of the instrument.

An accurately but easy fitting piston, B, works in the cylinder, the piston being kept in place by pressure from a spring, which presses upon the flanged top of the piston through the piston rod, F. The lower end of this rod is coned, and rests in a recess in the head of the piston, in order to prevent any possibility of the parts binding. The load on the spring may be varied by the screw and nut device, N, at the top of the indicator. Assuming the indicator cylinder to be in communication with the engine cylinder and the engine at work, it will be obvious that if the spring load on top of the piston is less than the gas pressure underneath it, the piston will be forced up against the annular flange which forms a part of the body of the indicator, this happening with every compression stroke. The bell crank lever, H, at the side, is a device which serves to magnify the



An external view of and a section through the Okill pressure indicator.

piston movement, and incidentally shows when the piston has any movement. The indicator is in adjustment when the spring load exactly balances the gas pressure, so that the piston of the indicator and the indicating finger at the side have no movement. On releasing the spring pressure, however, ever so slightly, the indicator finger will vibrate with the compression stroke of the engine piston, the balance of pressure being thus easily adjusted to less than 2 lb. per sq. inch. Briefly, then, to use the indicator—assuming it to be connected to the engine cylinder and the engine running at its normal speed—rotate the milled head until the side finger vibrates definitely, then reverse the direction of rotation of the milled nut until the finger just ceases to vibrate.

The barrel, C, of the indicator is marked off in simple micrometer fashion, so that the pressure can immediately be read off in lbs. per sq. in. or kilogs. per sq. cm. As showing the accuracy of the indicator reference may be made to *The Gas, Oil and Petrol Engine*, Vol. II, by Dugald Clerk and G. A. Burls (Longmans, Green and Co.), where results of observations made with the Okill indicator are given. In one of the tests on a 5 ins. by $5\frac{1}{2}$ ins. engine, having a compression ratio of 4.2 and running at 2,000 revs. per min., the Okill indicator showed a pressure of 99 lbs. per sq. in. absolute, which is exactly the same as the calculated pressure.

An educative pamphlet, containing much original data obtained by independent authorities with the aid of the instrument, is issued by Messrs. G. Taylor (brass founders) Ltd., All Saints' Street Works, Bolton.

A New American Height Record.

FLYING a 90 h.p. scout biplane belonging to the U.S. Army at San Diego, Cal., on October 8th, Capt. H. L. Muller ascended to a height of 17,440 ft., thus beating the old American record of 15,137 ft. made by de Lloyd Thompson.

Precautions on U.S.-Canadian Border.

ACCORDING to a message from Washington, American pilots have been warned not to fly across the border into

Canada during the war. It appears that an aeroplane was recently fired upon by the Canadian Guards near the Long Sault Canal, in accordance with orders issued by the Dominion Government.

A Spanish Fatality.

A CORRESPONDENT of the *Daily Telegraph*, writing from Madrid on Tuesday last, stated that an aviator, named Carlos Cortijo, had been killed during a flight of a military aeroplane at Carabanchel.

AIRCRAFT AND THE WAR.

WRITING from Flushing to the *Daily Mail* on the 22nd inst., Mr. J. M. N. Jeffries said :—

"The Germans were employing a captive balloon near Middelkerke, but hauled it down in a hurry on shrapnel bursting twenty yards away."

At the end of last week a number of reports regarding Zeppelins, and sheds for them, were in evidence. Thus according to a message from the Hague, it was reported from Brussels that the Germans are building airship sheds at Brussels, Ghent, Bruges and Antwerp :—

"Count Zeppelin is now at Brussels busily engaged in inspecting the works. Several thousand men from the workshops of Friedrichshafen are at work, and the sheds will soon be ready. The number of airships which are being sent to Belgium in detached pieces is rapidly mounting, and a fleet of 25 ships must be ready before November 15th."

The *Daily Telegraph* correspondent at Rotterdam telegraphed on Sunday that it was confirmed that the Germans had begun to build airship sheds near Brussels.

Further light upon this is shown by a report from a correspondent of the *Times* who was recently in Brussels :—

"The enemy have undertaken works of which the object evidently is to impress the inhabitants and to make them believe that the German domination of the city will be of long duration. They have doubled the size of the enormous shed which formerly gave shelter to the few Belgian dirigibles known to us in the manoeuvring ground at Etterbeek in front of the cavalry barracks. Gigantic pieces of ironwork make it clear to us what are to be the proportions of the new sheds, which are to house Zeppelins. On the aviation ground at Berchem-Sainte Agathe, which is jealously enclosed and strongly guarded, work is going on without respite, and at night time from this part of the western side of Brussels the sky can be seen glowing as if all the forges of Vulcan were at work in the enclosure. That is where the "Taube" aircraft are to be seen—the machines which make reconnaissances, always equipped with weapons of incendiarism and destruction."

Another report from Copenhagen said that the Germans are building an airship shed at Toender, in Schleswig, for two big Zeppelins.

According to news from Paris the Germans have constructed a Zeppelin shed to the north of Liège, and three of their aeroplanes were seen in the vicinity of the Dutch island of Vlieland, where a Zeppelin was sighted on Monday.

The Italian newspaper *Messaggero* on the 23rd inst. received a telegram from Lucerne stating that experiments were being made on Lake Constance with a new Zeppelin, fitted with a tube for throwing torpedoes. It was asserted that a flotilla of these new Zeppelins would be ready within a few months, when they will co-operate with the German fleet in an attack on the enemy's ships.

It was an heroic death which befell Senator Reymond, who, as our readers will remember, has done so much for the cause of aviation in France. His end was thus described by the correspondent of the *Daily Telegraph*, writing from Paris on the 23rd inst. :—

"News has reached Paris of the death of M. Reymond, Senator of the Loire, who since the outbreak of the war had distinguished himself as a member of the military aviation corps."

"While reconnoitring the enemy's lines he was struck by a Prussian bullet, but made a final effort to regain the French camp. His strength failing, the machine fell at an equal distance between the two opposing armies. The result was a fierce combat for the possession of the fallen aeroplane and fallen aviator, as the Germans were quick to recognise the value of the information he had obtained."

"In the struggle the French were finally successful, and Senator Reymond was carried back to the French lines, where he had still the strength to furnish to his superiors a detailed and precise report, which proved of the utmost value. Senator Reymond died

a few hours later, but not before the general commanding his division had pinned the Cross of the Legion of Honour on his breast.

"M. Reymond's death is a severe loss to the French aviation service, of which he was one of the most daring and successful members. Quite recently he was specially mentioned in army orders."

"By profession M. Reymond was a doctor, and held the rank of surgeon-major in the French army, but so eager was he to play the rôle of combatant in the campaign that, at his own urgent request, he was attached to the army aviation corps."

According to the *Daily Telegraph* correspondent at Petrograd, writing on the 22nd inst. :—

"Two German aeroplanes, which had been brought down by Russian marksmen, have arrived at Warsaw."

A Reuter message from Petrograd on the same date said :—

"If further proof were needed of the ineffectiveness of bombs thrown from aeroplanes, it is afforded in the fact that German aviators over Warsaw missed the railway, the fire-station, and the telegraph and telephone stations, as also troops on the march. The bombs struck the roofs of private houses, destroying the upper storeys. One bomb fell harmlessly on a public fountain, another on a public garden, and a third on a soft flower-bed. Another fell on a tree and did not explode. Only one was attended with any success."

"During these anxious days in Warsaw it was popularly reported that the German Emperor had said that, if the town could not be taken from land, it must be taken from the air. The appearance of aeroplanes seemed to confirm this, but the inhabitants soon became more or less indifferent to these."

In this connection the *Times* correspondent at Warsaw wrote on the 27th inst. :—

"Intense indignation is felt here, especially among foreign residents, at the wholesale dropping of bombs from aeroplanes by German airmen. This practice continued from October 16th till till October 23rd. The total number of deaths caused was 14, and the number of persons wounded is between 20 and 30, practically all innocent civilians. Simultaneously with the dropping of bombs, packets of pamphlets in the Polish language were distributed stating that the population must not fear the Germans, as no civilian would be injured, and only Government property would be destroyed. This pronouncement is ludicrous, as the property damaged in the city all belonged to civilians."

"One aeroplane was winged by the Russian soldiery, falling with the pilot, who was killed on the spot. His companion was not hurt, but blew out his brains before he could be captured."

"Especially annoying was felt here by Americans, as one bomb fell within a few hundred yards of the American Consulate, which was obviously not a Government building. The aiming of the German bomb-throwers was apparently hurried and utterly irresponsible."

During the week end five German aeroplanes were brought down by the French, and the following message from Mr. A. Beaumont to the *Daily Telegraph* gives the details :—

"It is gratifying to be able to report that in the last two days, 24th and 25th inst., the French army has been able to destroy five German aeroplanes that had set out on bomb-dropping, and very nearly brought down a sixth. This is a remarkably good record, for if, hereafter, five out of six can be destroyed, the German air flotilla will soon be out of existence."

"One of the first was a Taube which flew over Rheims, and dropped several bombs, which did not kill anyone, but caused some damage to buildings. A French aeroplane immediately started in pursuit with a machine gun on board, and an exciting chase was begun. Another German Taube seeing its congener in a bad plight started to the rescue, but was unable to prevent the pursuit. The German aeroplane was disabled just as it got above the line of the German trenches, and fell from an enormous height. It turned several times in the air, and its occupants were certainly killed."

"Two German aeroplanes, one a Taube and the other an Aviatik, flew on the same day over Montdidier. They were similarly chased, and both of them were shot down when at a height of about 4,000 ft. over Méharicourt. The fourth, as already reported, was shot down at a place between Dunkirk and Nieuport, and fell on the beach after it had thrown a bomb on Gravelines."

"Finally, the fifth German aeroplane intended to make an attack on Amiens. It was here that two weeks ago, as I was

standing near the railway station, a German aeroplane dropped two bombs, one of which unfortunately blew off the limbs of a poor woman within a few yards of where I was standing, and she died a few hours later at the hospital. Her death has now been avenged, and we should be glad to know that it was on the very same aviator who threw that bomb. The aeroplane appeared some distance east of Amiens, and a French biplane immediately started in pursuit from the neighbourhood of Saint-Roch. It was mounted by two non-commissioned officers, Strokick and David. They disabled the German machine by a well-directed shot, and it fell and was wrecked, and the pilot was killed. The two plucky aviators received the military medal, and were warmly congratulated."

According to news received in Paris on Monday, a French airman brought down a German machine which had dropped four bombs over Verdun, causing trifling damage to property.

In a message to the *Daily Telegraph*, written in Northern France on Monday, Mr. W. T. Massey said:—

"The soldier applies a nickname to everything. All have heard of the 'Jack Johnsons,' the 'Black Marias,' and the 'Coal Boxes.' The 'Archibald' is a much smaller shell, but just as uncomfortable. The aviator has thus christened the small shell fired by the anti-aircraft guns of the enemy, and no aeroplane comes to earth now without the pilot being asked if he has met 'Archibald' on his journey. His is irritating company. He is a small, vicious fellow, and, unlike his shrapnel predecessor, bursts upwards.

"Our aviators believe the Germans use the anti-aircraft guns in batteries. They generally fire two rounds to find the range, and then throw up a very rapid fire. At 6,000 ft. the 'Archibalds' are mischievous. They have a range of about 9,000 ft., beyond which military aviators rarely soar, as observation is impossible at a greater height. Although some of our aeroplanes have been hit by spreading 'Archibalds'—two had planes holed on Saturday—not one machine has been brought down by them."

Writing from Belgium to the *Daily Telegraph* on Saturday, Mr. E. Ashmead-Bartlett thus described the tactics of the Germans bombarding Dixmunde when some French batteries went into action:—

"With their customary thoroughness the Germans immediately set to work to try to locate the new arrivals. They sent up a huge cigar-shaped captive balloon to a great height. This was out of range of the French and Belgian guns, and remained floating gracefully aloft all the afternoon. Soon they began to reply to the French howitzers, but could not find the range, dropping their shells all over the neighbouring fields without doing any particular harm. Finding that their fire brought no cessation to that of the French, they despatched an aviator, who circled round and round at a great height like a hawk trying to locate his prey. However, as their fire became no more accurate, he seems to have failed in his mission."

Another message from a *Daily Telegraph* correspondent said that the military aviators had seen behind the German lines the scars on the land, which told of preparations for retirement. The scars, it is stated, are the trenches made by a digger hauled by a traction engine.

From Paris, Mr. G. H. Perris sent to the *Daily Chronicle* the following details of an incident in which Louis Paulhan was involved:—

"M. Paulhan's mechanic tells the story of a daring flight to Amiens over the German lines, which he and the distinguished aviator made. Passing over a German aeroplane station, they were hailed with a salvo of bullets. Then an enemy aeroplane came in sight below them. They dropped to meet it, and the mechanic, aimed his quick-firer, bringing the German machine to the ground with a frightful crash. When M. Paulhan tried to rise higher he found that a bullet had cut a hole in his petrol tank, and that his engine was also damaged. With great difficulty he managed to keep in the air till he was just within the advanced French lines. Seeing him descend, a squad of Uhlans tried to rush the position. The mechanic, however, turned the quick-firer on them, and with the aid of some French chasseurs, the attack was repulsed."

"That the work of the aviators attached to the Allied armies is being severely felt by the Germans is shown by an "order of the day"—a copy of which came into the possession of the French General Staff—of which the

following extract was sent from Paris to the *Daily Mail* by Mr. George C. Curnock on Tuesday:—

"According to the report of a squadron of aeroplane observers, our troops are very easy to mark in fighting, in spite of their grey uniform, because of the density of their formation, while the French know apparently how to protect themselves perfectly against aerial reconnaissances. During a fight it is necessary that our troops should make the task of aerial reconnaissance more difficult by more careful use of the country—making use of narrow files along trees, edges of villages, the shelter of houses, avoiding mass formations; above all, absolute stillness in exposed places. At the approach of an aeroplane all movement ought to cease.

"It is necessary to assimilate the coverings of artillery to the surrounding ground, not only in front but also against the view from above. Avoid all movement of batteries as soon as an aeroplane surveys the position; a single man in movement will betray a battery. Upon the approach of an enemy aeroplane there should be no firing, for the flash of the gun betrays the position from afar.

"To satisfy themselves regarding the visibility of their positions the commandants of brigades, regiments, or groups of artillery will find the air squadrons willing to make flights for them of ten to twenty minutes' duration in order that they may survey their own positions. The fact should be noted that in a first flight an observer does not see very much. The advice of the airmen should be taken as to the best manner in which to conceal positions."

According to *La Suisse*, of Geneva, after the battle of the Marne the Crown Prince had a very narrow escape at Révigny. A French airman dropped a bomb on the road within 20 yards of where the Prince was, with the result that 15 men were killed and 22 wounded, while 36 horses were killed.

A telegram from Berlin on the 25th inst. reported that a British pilot, whose name was given as "Col. Grey," had been obliged to descend at Frankfurt owing to engine trouble and had been taken to Darmstadt.

Writing from Belgium to the *Daily Telegraph* under Sunday's date Mr. E. Ashmead-Bartlett said:—

"In the afternoon I saw an interesting attempt on the part of the German gunners to bring down a French aeroplane which was scouting over their lines. The German field guns, which had been bombarding Nieuport, turned their attention to this aeroplane, and for several minutes it was surrounded by bursting shrapnel. Most of them were far away, nearly always behind the tail of the machine, which glided gracefully on its way, until the gunners gave up their work in despair."

A correspondent of the *Temps* at Petrograd, at the end of last week gave the following particulars of a new aeroplane captured in Transylvania, the pilot being the famous aviator Beatche:—

"The machine measures 55 ft. in breadth, and is 35 ft. long. It is a two-seater, and has ample accommodation for guns and ammunition. The Russians are now using it with wonderful results near Warsaw. They are also repairing the Zeppelin they recently captured, with a view to employing it against the enemy."

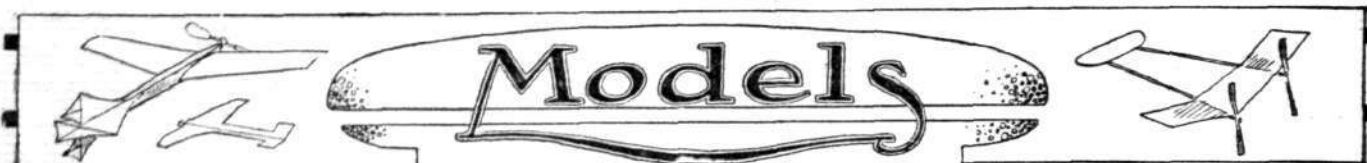
The following details regarding a new machine which is said to have been invented by an engineer of Prague, named Stiazny, a former pupil of the Russian aviator Sikorski, are taken from the *Neues Wiener Journal*:—

"The machine is provided with two benzine tanks of 800 litres capacity each, an oil tank with a capacity of 40 litres, and receptacles for a great number of bombs.

"It is driven by two Gnome engines of 100 h.p. each. On the 21st inst., during its first trial flights, the fore part of the machine, while running on the ground, suddenly broke off, the machine capsizing and being completely destroyed. The building cost is said to have been 130,000 crowns (about £5,400)."

According to a Reuter message from Ostend on Wednesday, the Germans have erected near Ostend an airship shed of non-inflammable canvas.

Writing to the *Daily Mail* under date of October 22nd to contradict the report of his death, Mr. Louis Noel said: "I am still all right. We were three Noels at the beginning of the war. I am now left alone, and hope to avenge the death of the others."



Edited by V. E. JOHNSON, M.A.

Mr. Holman's Twin-Propeller Monoplane.

OUR correspondent writes to us as follows: "I am enclosing for your inspection two" [one—the better design of the two—is reproduced—V.E.J.] "blue prints of designs which I have got out for r.o.g. machines. They are both original, and may (with limitations) be taken to represent the average type of machine flown by members of the Dover Model Aero Club. The members of the above club have for some time past been in bad repute in the model world owing to the fact that their machines seemed exceptionally heavy; but the following fact may be of general interest:—The only available central flying ground that could be obtained was the Northfall Meadow in which M. Blériot landed after crossing the Channel. This meadow was a good time ago abandoned by the military authorities as a shooting ground on account of the uneven contour of the ground, and the gusts and eddies which were consequently set up when there was any wind." [We should, perhaps, explain that Mr. Holman's communication is dated July 1st last.] "Bearing this fact in mind, can it be wondered that the strength of the machine needs to be well above the average?"

"However, the distances and durations attained have improved somewhat of late, as the club report for the month shows.

"I should be extremely pleased if readers of FLIGHT would point out any mistakes in design and give some friendly criticism on the same."

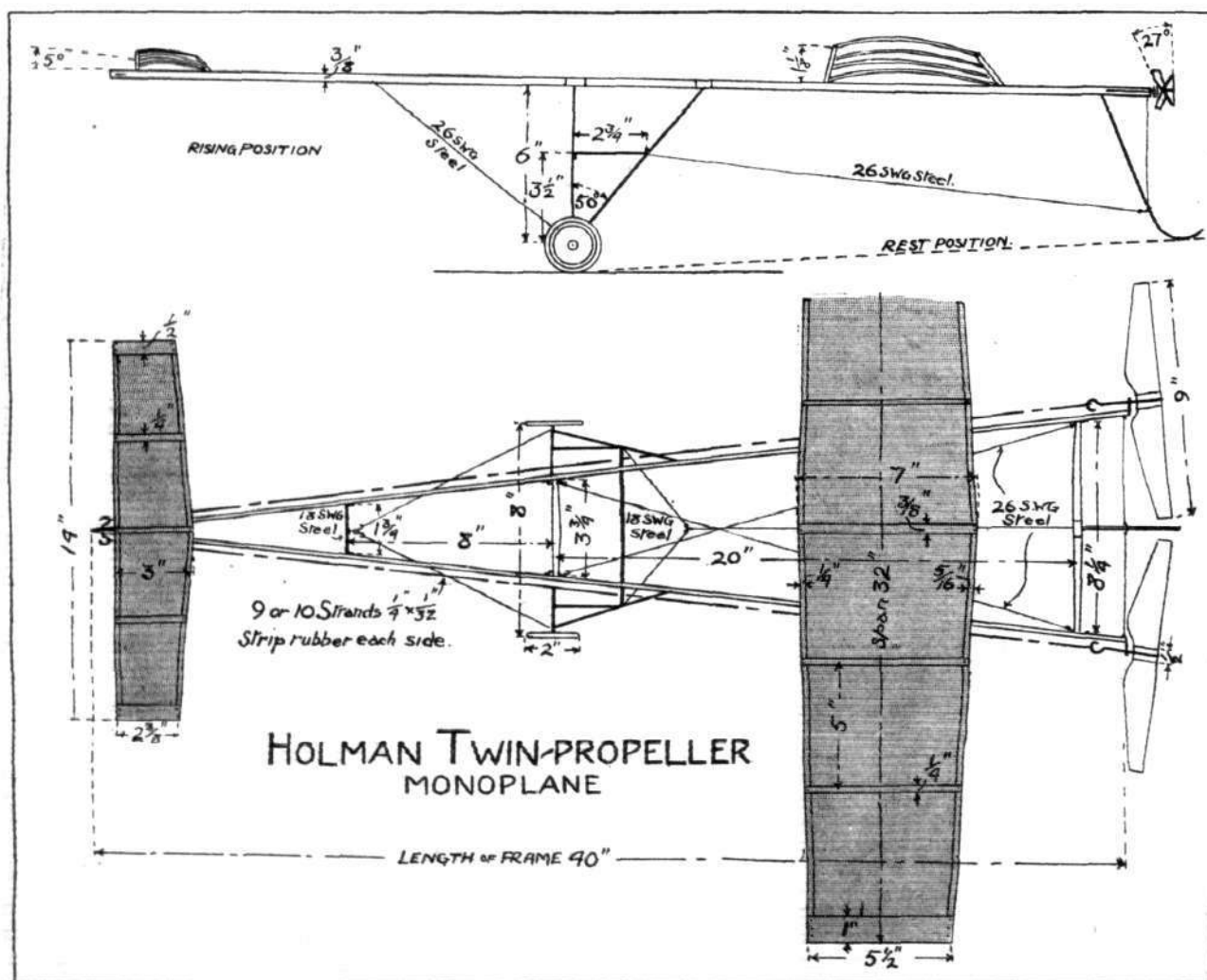
Although this particular type of machine is one which finds no favour with us either with respect to design or usefulness, it is or has been the popular favourite for reasons which are too well known

to require stating, and we shall be pleased to publish any good criticisms.

Tandem Propeller Models and Concentric Spindles.

So far as neatness of design is concerned, the usual type of twin propeller A frame or single stick model aeroplane has certainly but little to recommend it, more especially, perhaps, the latter. In the early days of aeronautics when no full-sized design had been standardised, incongruities, both in full-sized and model work, may be said to be an essential feature of progress; but as progress is made, along certain lines, of course, such anomalies ought to die either a natural or an unnatural death. The chief feature of ugliness in the single stick twin propeller model of the ordinary type is undoubtedly the rubber motors, sticking out on either side right away from the rest of the machine. The ordinary A frame, although, of course, quite sound from a mechanical point of view, must always possess a large lateral moment of inertia, and is a design to such an extent removed from full-sized work, even so far as mere appearance goes, as to deprive it of any scientific interest, at the present time; it belongs essentially to the past.

The advantage of using twin-propellers, *i.e.*, two propellers instead of one, is—more turns of the rubber motor, longer durations, and therefore better flights. The stability problem is also simplified, since the torque, or rather the reaction of the model to the torque, of the single rubber motor is got rid of; there are also other advantages. There is, therefore, every reason for employing more than one propeller.



The Holman twin-propeller model monoplane.

One of the earliest types that the writer remembers were the twin-screw models of Mr. Burge Webb, having one propeller in front (tractor) and one behind (pusher). These were very light one-plane models, and although somewhat tricky to launch, gave remarkably good results. The design is not, however, a neat one, and becomes more and more difficult as the size of the model increases.

During the present year the writer has been making a number of experiments with model submarines: (1) rubber-driven, (2) fitted with electrical motors and automatic controls worked by the same agency. In the case of the earlier rubber-driven models, in order to obtain longer runs and overcome the reaction to the motor torque, a model was fitted with twin propellers and rubber motors *à la*

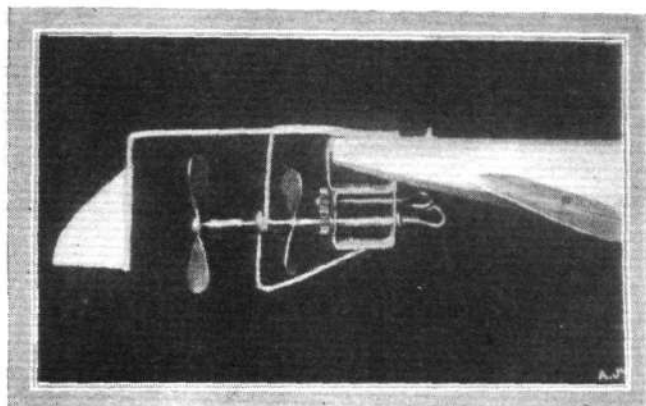
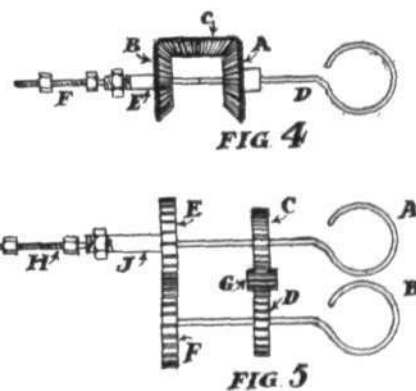
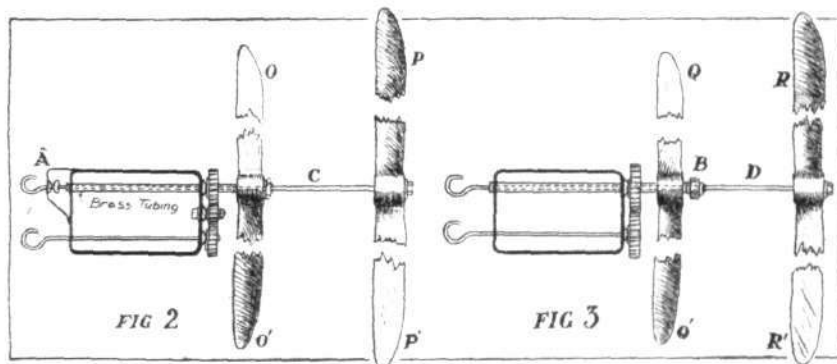


Fig. 1.—Part view of rubber-driven submarine model with tandem propellers and concentric gear.

ordinary single-stick model aeroplane. The ugliness and incongruity of such a monstrosity in design (which worked quite successfully) quickly led to the adoption of the tandem propeller, as shown in Fig. 1. The results obtained were very good, and it is with a view to experiments along similar lines in aeronautical models that these lines are penned. Some experiments have, of course, been made in this direction already; probably the best-known model of this type was Mr. Aston's 1-oz. model, built for the famous 1-oz. competition, held some years ago, in which quite a number of the leading aeromodelists of those days took part. The results obtained with this model were extremely good. It has



Figs. 2 and 3.—Tandem propellers on concentric shafts. Figs. 4 and 5.—Two types of concentric gearing by Mr. F. Mayer.

also been used (and may for anything we know to the contrary still be employed) in the case of modern torpedoes, which have now a range of some 7,000 yards and a speed at any rate of 35 knots, some accounts say 45 knots, but this we doubt. The employment of twin propellers in this manner leads to the building of a model of the best streamline form.

At the very first Royal Aero Show at Olympia, a full-sized machine, fitted with tandem propellers, was on exhibition. So far as we remember, the machine had no distinguished career, but in those early days, it might well be due to many causes, other than this particular feature in design. In the designs shown in Figs. 1, 2 and 3, the rear propeller is mounted on a steel wire spindle running right through a piece of brass tubing in which it revolves, this brass tubing itself revolving in suitable bearings by means of cogwheels suitably arranged. The two axles turn, of course, in opposite directions. One rubber motor, therefore, drives the rear propeller *directly*, whilst the other drives the leading propeller mounted on the brass tubing by means of suitable cogwheels. In Figs. 1 and 3 it will be noticed two cogwheels only are used. In this case both

rubber motors must be wound up in the same direction. In Fig. 2 a central idle or jockey cogwheel is inserted, which allows an ordinary model twin winder to be used. In the former case the strands of rubber must be kept well apart or they will interfere with one another. The idle cogwheel used need not be of so large a diameter as the two others, although it is shown so in the figures. In Fig. 1 the rear propeller has for an abutment the outer wire ring bracket; in Fig. 2 the small extra piece A serves that purpose, and in Fig. 3 B is a ball-bearing abutment. This is necessary if the rear propeller shaft has an abutment against the axle of the leading propeller; on account of the friction caused by the pull of the rubber motor driving the rear propeller, the propellers do not run evenly.

In Fig. 1 the smaller and leading propeller has a diameter of 1.5 ins. and the rear one of 2 ins. In the case of aerial propellers, as shown in Figs. 2 and 3, the dimensions could be 8 ins. and 12 ins. Since the rear propeller is working in the slip stream of the leading one, it must be given either a coarser pitch or a greater diameter, or possibly both. There is also the question of their proximity to be considered.

In Figs. 2 and 3 the steel spindle, C, Fig. 2, and D, Fig. 3, is supposed to be several inches in length, and the bearing of the rear propeller to be such that it can be placed in any position along this spindle; if the spindle were threaded and nuts used on both sides of the propeller, this could easily be done, the idea being to find the position of maximum efficiency.

Obviously the whole question is one in which a considerable amount of interesting experimenting could be done. The system is efficient in the case of marine propellers under certain circumstances. Possibly it would be less so in the case of propellers working in air; but so far as we know a sufficient number of experiments have not yet been carried out to enable a satisfactory answer to be given. We shall be glad to hear from any reader who may have experimented in this direction with respect to either aerial or marine propellers.

Mr. F. Mayer (of Messrs. J. Bonn and Co.), with whom we briefly discussed the matter a few days ago, writes as follows:—

"I enclose herewith two drawings (Figs. 4 and 5) of the gear devices mentioned at our interview. These gear arrangements are technically known as co-centric or concentric spindles.

"The one shown in Fig. 4 is what is termed a differential gear, and that in Fig. 5 a lazy shaft gear. As you know, I have had considerable experience in gearing in all its branches, and from time to time have made use of most of the known arrangements and have used co-centric gears in a variety of forms and for a

variety of purposes. The commonest type of co-centric gear is the spindle and sleeve on which the handles of clocks and watches are mounted; in the case of clocks and watches the spindle and sleeve have a ratio of 12 to 1. This is merely a matter of diameter and number of teeth in the various wheels. This is the only instance that I know of common use for this type of gearing; but I have seen it used on aero-models, on torpedo propellers, on an aero-engine, and some cinematograph projectors have the shutter and flicker blades driven by this means.

"In Fig. 4, a train of three bevel gears are used. Bevel gear A is fixed to spindle D; bevel gear B, mounted on its own sleeve, E, which runs loose on the spindle, D; B is driven by the idle bevel, C. The propellers are mounted at E and F. In place of bevel gears crown wheels and pinions can be used.

[This is a very neat arrangement, possibly the neatest; in this method, for rubber-driven model aeroplanes, only one rubber motor would be used, the reaction to motor torque would be got rid of, but the duration would be rather lessened than increased, owing to increased friction, more strands of rubber, &c. This type, there-

fore, does not commend itself to such, but for any engine model it is very possibly the best.—V.E.J.]

"Fig. 5 requires two skeins or bundles of rubber. The wheels, *d* and *f*, are fixed on the spindle, *B*. The wheel, *c*, is fixed to the spindle, *A*; the wheel, *e*, on its sleeve, which runs on the spindle, *A*. The pinion wheel, *g*, is inserted between *d* and *e*, to give a reverse direction to each. The propellers are fixed at *H* and *J*.

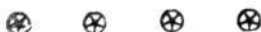
"This type of gear has been known among model aeroplane makers as the Wild Cat gear. I do not suppose there are many aeromodelists in the ranks now who remember how it earned this curious name. It happened thus: Some years back (this sounds like a history lesson), in the days of the Aero Models Association, a number of competitions were held for 1 oz. models. One competitor, viz., Mr. W. G. Aston, built and fitted his model with one of these

gears. The complete model weighed less than an ounce, and for this reason won the name of the Wild Cat. N.B.—A wild cat is a smaller animal than an ounce.

"In experimenting with two propellers run in this way, one in front of the other, quite a number of experiments can be tried. For instance, the diameter, distance apart, pitch and speed can all be varied.

"I am of the opinion that the rearmost propeller should have a coarser pitch than the front one. I once had a conversation on this subject with a marine propeller expert, but he did not, however, agree with my views."

We hope to hear from quite a number of our readers on the foregoing, which appears to be one in which some really useful experimenting might be done in model form.



KITE AND MODEL AEROPLANE ASSOCIATION.

Official Notices.

British Model Records.			
Single screw, hand-launched	Duration ...	J. E. Louch ...	95 secs.
Twin screw, do. ...	Distance ...	R. Lucas ...	590 yards.
	Duration ...	T. D. Collingwood ...	
Single screw, rise off ground	Distance ...	W. E. Evans ...	145 secs.
	Duration ...	J. E. Louch ...	290 yards.
Twin screw, do. ...	Distance ...	L. H. Slatter ...	68 secs.
	Duration ...	J. E. Louch ...	365 yards.
Single-tractor screw, hand-launched	Distance ...	J. E. Louch ...	2 mins. 49 secs.
	Duration ...	C. C. Dutton ...	266 yards.
Do., off-ground	Distance ...	J. E. Louch ...	91 secs.
	Duration ...	C. C. Dutton ...	190 yards.
Single screw hydro., off-water	Distance ...	J. E. Louch ...	94 secs.
	Duration ...	L. H. Slatter ...	35 secs.
Single-tractor, do., do.	Distance ...	C. C. Dutton ...	29 secs.
	Duration ...	S. C. Hersom ...	65 secs.
Twin screw, do., do.	Duration ...	D. Stanger ...	51 secs.
Engine driven off grass	Duration ...		

Official Notices.—A secretaries' meeting was held on the 21st inst., in order to discuss the winter's programme. It was agreed that each secretary would endeavour to arrange inter-club contests during the winter months. It was further agreed that attempts should be made to improve on the present official records. Official notice should be sent to the model sec., H. A. Lyche, a clear fortnight before the flying is to take place, so that it may appear in FLIGHT one week beforehand, and give the present holders of records the opportunity of being present.

A competition for compressed air models will be held on Wimbledon Common, Saturday, Nov. 14th, at 2.30 p.m. All particulars will be published in FLIGHT at a later date.

All communications to be sent to H. A. Lyche, Hon. Model Secretary, 46, Templeshen Road, East Sheen, S.W.

AFFILIATED MODEL CLUBS DIARY AND REPORTS.

Club reports of chief work done will be published monthly for the future. Secretaries' reports, to be included, must reach the Editor on the last Monday in each month.

Leytonstone and District Ae.C. (14, LEYTONSTONE RD., STRATFORD)

WEEK-END flying, as usual, on Wanstead Flats, 10.30 prompt. Junior tractor competition held over until senior twin-screw competition on Nov. 8th. If wet, meet at clubroom.

Paddington and Districts (77, SWINDERBY ROAD, WEMBLEY).

OCT. 31ST, practice flying at Sudbury, Nov. 7th, competition for single propellers and tractors for prizes value 7s. 6d.

Monthly Report.—Less flying than usual has been indulged in during the past month, several members having joined the King's Forces. The handicapped competition for single-propeller models on Oct. 3rd was won by Mr. T. Carter with 58 points; Mr. D. Driver (scratch), second, with 57½; H. Woolley, 50; and W. E. Evans, 44. On Oct. 10th, Mr. R. Bird, having repaired his compressed air-driven canard monoplane, was out testing it. Several r.o.g. flights were made, the best of which was 20 secs. Soon after rising the model began to rock laterally and this gradually increased in intensity the further it travelled, giving the onlookers apprehension as to its landing. In fact, this defect led to some abrupt landings which eventually placed the model temporarily hors de combat. Oct. 17th, Mr. H. Woolley out testing new twin-propeller monoplane, obtained several good flights. Mr. T. Carter testing kites in tandem, but wind was too light. W. E. Evans testing baby tractor with enclosed fuselage, also single-propeller tubular fuselage monoplane. The secretary out again on Oct. 24th with same models. A few members have been obliged to resign owing to the war, and one new member has been elected, namely, Mr. Cyril Sheeran, of 64, Mortimer Road, Queen's Park, N.W. At the autumn general meeting held on Oct. 22nd, the secretary announced that the funds in hand amounted to over £2. The suggestion of the committee to hold only one competition each month and to increase the value of the prizes in proportion was agreed to. A discussion, introduced by Mr. W. E. Evans, on research work by members led to the decision to attempt to compile data giving complete detailed descriptions of models with observations on the flights resulting from various modifications. It is hoped something useful may be derived from this innovation.

Sheffield Ae.C. (41, CONISTON ROAD, ABBEYDALE, SHEFFIELD).

OCT. 31ST, Tinsley Park Brick Yard, hydro-aeroplane competition as announced last week. Should the weather be unsuitable on the above mentioned dates, the contests will take place on the following Saturdays, same place and time.

Monthly Report.—Oct. 6th, at general meeting, Mr. W. A. Smallcombe, of the Bristol and West of England Aero Club, and Mr. W. A. Lazenby were enrolled as members of the club. Some of the members are away serving their King and country during the war. Oct. 15th, a special meeting was held to discuss the alteration of "Colver Cup" rules for r.o.g. machines. It was decided that the contest be held on similar lines as the Bristol and West of England Aero Club competition, Aug. 1st last, on the marking system, which has been introduced with the idea of improving designs and experimental research.

Marks will be awarded for design, construction, rising, landing, lateral stability, directional control, longitudinal stability. No model will be judged under 10 secs. duration. All the printed rules governing the Cup, except Rules 5, 6 and 7, will still be in force. The contest will take place at Standhouse Aerodrome, Intake, on Nov. 28th, at 3 p.m. Members must be at the judges' flag between 2.45 and 3 p.m. Mr. Hannam has been enrolled a member of the club.

South-Western Aero Club (373, BRIXTON ROAD, S.W.).

NOV. 14TH.—Competition at Brockwell Park, for r.o.g. tractors, for three prizes offered by Mrs. Prodder.

Monthly Report.—A meeting was held in the clubroom on October 13th, when Mr. V. Drake, the secretary, handed in his resignation, he having joined the Bucks Yeomanry. The President, Mr. Prodder, in proposing a vote of thanks to Mr. Drake, said: "It was very gratifying to note that the club had its share of members either serving in His Majesty's Forces or in drill corps." Mr. F. Miller has joined the R.A.M.C., but being billeted at home, he still attends the club in the evenings. Mr. D. Prodder, Mr. S. Smith, and Mr. C. Archibald are undergoing voluntary training in drill corps. Mr. P. W. Peel has been elected secretary, and in future all communications should be addressed to him, c/o above address. The r.o.g. competition (all types) for the club's prize was held at Brockwell Park on Oct. 17th, and not at Wimbledon Common, as announced in last month's report, nine members competing. Very windy weather prevailed, causing six competitors to drop out through smashing their machines. Mr. S. Smith, flying a very neat built-up fuselage twin-pusher Dunn-type wing monoplane, was declared the winner, with 50 marks; Mr. D. Prodder, twin-pusher monoplane, very good stability, second, with 46 marks; and Mr. G. A. Norchi, twin-pusher A-frame, third, with 37 marks. A meeting was held in the clubroom in the evening, at which it was announced that Mrs. Prodder had offered three prizes. It was decided by the members that the competition should be for r.o.g. tractors, to be held on Nov. 14th. Flying meetings have been held every Saturday during the month at Brockwell Park. Mr. R. Bell's 2 ft. 6 in. tractor, during one flight, flew out of the park, alighting on its propeller, placing it hors de combat. This member has been experimenting with a tractor screw of original design. Mr. S. Smith has constructed a tractor monoplane. This machine has a Dunn-type wing of 3 ft. span, and an overall length of 3 ft.; 8 strands of rubber drive a laminated propeller of 10 ins. diam., constructed by him. The chassis is of bamboo. The total weight of the model is 6 ozs. This model is as yet not quite tuned up, but during the initial trials it showed great promise. Mr. D. Prodder's built-up fuselage twin-pusher has been out regularly, always obtaining best duration and altitude. Mr. P. W. Peel's enclosed fuselage monoplane, described in FLIGHT No. 298, has now undergone several alterations as regards wing area, his best duration to date being 30 secs. Mr. Dickson, fine flights with his h.l. twin-pusher monoplane. Mr. Webb, a new member, has had his h.l. bow frame twin-pusher out, but being under-powered the flights were of short duration. On Oct. 11th there was an early-morning meeting at Brockwell Park, when some interesting "snaps" of the flights were taken. The machines most prominent in the morning's work were Mr. R. Bell's tractor, Mr. D. Prodder's twin-pusher, and Mr. P. W. Peel's covered-in fuselage. Mr. Bulford, one of the founder members, has rejoined the club, and it is expected he will have a machine out shortly. Mr. Clark has been experimenting with paper gliders, and has obtained some respectable glides with an enclosed-body Taube wing monoplane. Four new members have been enrolled this month.

Stony Stratford and District Kite and Model Ae.C. (OLD STRATFORD).

THE new season's programme is to be arranged at the next meeting, Nov. 4th, and the secretary invites suggestions from absent members.

Monthly Report.—At the usual monthly members' meeting in clubroom on Oct. 9th, it was decided to hold over the annual general meeting in consequence of the war and to discontinue the branch at Buckingham till new arrangements can be made. About 25 per cent. of the club members have enlisted or are on active service. The 11th and concluding competition of the season was held on Oct. 17th, when a fairly representative turn out was witnessed, the results being, Mr. Brown, 1st, 62½ marks; Mr. H. Neave, 2nd, 32½ marks; Mr. Mennell, 3rd, 32½ marks. Mr. Neave is one of our oldest junior members, having been in the club since its inception, and it is a pleasure to record an appearance in the prize list of an energetic worker, but somewhat unlucky one. The best performance of the afternoon was Mr. Mennell's flight of 52 secs. with a single-gear h.l. single-propeller model. Mr. Mennell is a keen contestant for the single-screw class records, and it is interesting to add that our members find that a high-speed large diameter propeller is the most successful for single-screw models. A new junior member, Mr. J. Clarke, has won the pair of propellers by M.S.C. for the best performance by a novice. It is gratifying to note that the efforts of the secretary and one or two other members to endeavour to institute a wide range of types are bearing fruit, a number of r.o.g.'s now being seen. R.o.g. flying has been indulged in by Messrs. Hamilton and Brown, the latter getting just over 20 secs., the former 20 secs. Oct. 24th was a single-screw day, Mr. J. Clarke's first single was out for tests, and in the hands of Mr. Mennell obtained 32½ secs., a good result for the first attempt at a single by a junior member. Mr. O. Hamilton, junr., out with a 4 ft. single of the boat-shape variety, getting 25 secs. with 400 turns. It is pleasing to report that a deeper interest seems to be taken locally in our work, and this is due to a little press work in the shape of regular reports.

Wimbledon and District (165, HOLLAND ROAD, W.).

OCT. 31ST, flying 2.30. NOV. 1ST, flying 11.30.

Monthly Report.—During the past month a great deal of work has been done

with compressed-air-driven models. Mr. Laing's tractor has been out each week doing high flights, with an average of 30 secs.; it is now fitted with double-surfaced wings, and a double-surfaced cambered tail has also been added. Mr. Boniface's tractor has been going well, and on Oct. 10th he made a successful attempt on the c.a. duration record, getting one flight of 47 secs., an improvement of 4 secs. on Mr. Laing's previous record. Several other flights of over 40 were obtained on the same day. Mr. Tucker's Avro biplane was out early in the month, but a nose-dive from 20 ft. wiped out the central-skid chassis with which it was fitted; this has now been replaced by a light racing chassis, the saving in weight making a great difference to the speed of the machine. Mr. Hayden's tractor monoplane made its first appearance on Oct. 18th, arousing great interest on account of the novel features it embodies. The tank and 2-cyl. engine are of his own construction, and the double-surfaced wings of 6 ft. span are placed beneath the tank, and have a very large dihedral. After a few adjustments, some very good flights were made, the best 38 and 39 secs., the machine flying steadily at a very slow speed. Mr. Chown's single-pusher canard, which had been under-going alterations, reappeared on the 18th. Several flights were made, including one of 20 secs., but it has been decided to abandon this type of model, as it does not give as good results as the tractor type. Mr. A. B. Clark had out his fast monoplane on the 25th, but after one flight a piece of wire pierced the tank, with disastrous results. Rubber-driven models have been in a minority, but a good deal of flying has been done. Mr. W. G. Smith has flown several light twin-screws, getting particularly good results with his 3-oz. 1-1-0-P₂ machine, which has done over 100 secs. on several occasions. On Oct. 17th, Mr. Chown made an attempt on the hand-launched duration record, flying a 3-oz. hollow-spar 1-1-0-P₂ machine, 3 ft. long. After one flight of 134 secs. out of sight, he succeeded in obtaining the record with a flight of 145 secs. Mr. Tucker's 30-oz. Martinsyde made a welcome re-appearance on the 17th, flying in its old style very gracefully. Mr. Powell's twin-screw 0-1-1-P₂ has also been out after a long absence, doing 80's. On several occasions, illuminated flying has been carried on by Messrs. Laing, Boniface, Tucker, and others, the large c.a. models looking very fine with "Sparklers" on board.

UNAFFILIATED CLUBS.

Burton and District Aero Club. (156, SHOBNAIL ROAD.)

WORKSHOP, Bearwood Hill Road, next door to Swan Hotel.

Monthly Report.—Owing to the War many members of this Club have joined the Army, several of our best men being called up with the Yeomanry. Renewed efforts have been made by the secretary, the sole member of the Committee left at home, to get the club again in working order. A large joiners' workshop fitted with benches has been secured, and 5 large windows giving ample light for any kind of work. There is also an office attached which is being fitted up as a reading room, and good provision for warming is installed. It is evidently appreciated, as 18 new members joined in September. On Sept. 30th, F. M. Naif gave an interesting mirroroscope lecture, showing on the screen most of the German Taubes now taking part in the war. On Oct. 21st instruction was given by C. G. Lamb in the carving of propellers, a dozen good specimens being the result. Oct. 28th, a paper was given by the hon. secretary on "Technical Terms Used in Aviation," with diagrams showing the different subjects on the screen. A lecture on propellers will be given by Mr. C. J. Robinson on November 6th, showing in a practical manner with his apparatus the thrust given by different makes. The senior members are subscribing weekly towards a fund for the material for a full-size machine which it is hoped to start building shortly. Monday, Wednesday, and Saturday evenings are club nights, and anyone will be welcome.

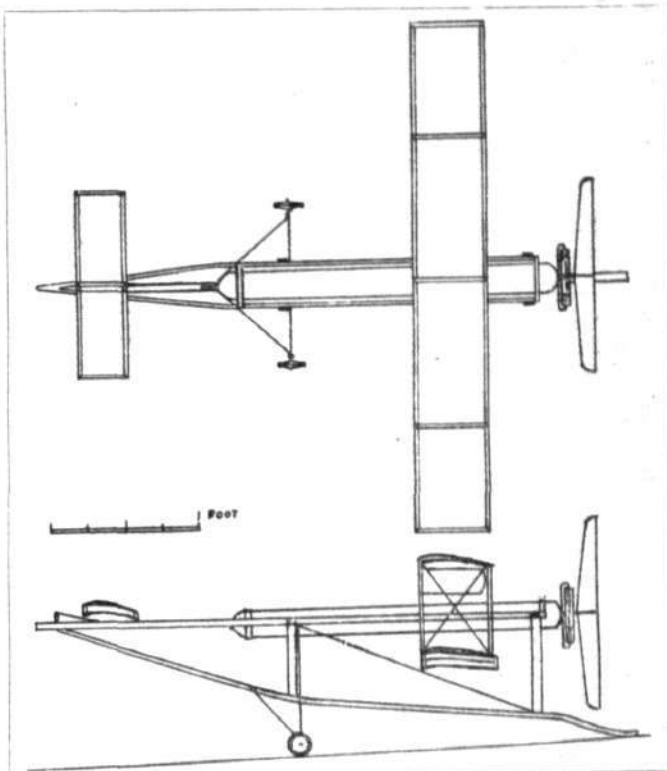
Dover Model Ae.C. (44, OSWALD ROAD, DOVER.)

Monthly Report.—The club has been considerably affected by the war, both as regards the number of members and the possibilities of flying in the neighbourhood. Four members have joined the Forces, these being Messrs. Macdonell, Worster, Marsh, and Davis, the latter being in the R.F.C. Mr. Macdonell has been appointed lieutenant in Strathcona's Horse. Mr. Holman is very hard at work in the Royal Aircraft Factory. Consequently, the flying has been greatly restricted. Mr. Sargeant has constructed a scale model of Blériot's cross-Channel aeroplane, and it has been presented to the Dover Museum. This model took 150 hours to make, and is an excellent piece of workmanship. Mr. Sargeant has also constructed two power-driven biplanes, both of which have made splendid flights. Mr. J. Watts has been flying tractor monoplanes and a large Canard biplane, which has given flights of 50-70 secs. duration. Messrs. C. Watts, Hill and Whorwell have been flying tractor monoplanes, all of which have done well. Owing to Mr. Macdonell's departure, Mr. C. Watts has been elected secretary of the club. It has been decided that there shall be no exhibition this year. The secretary will be pleased to supply any information with regard to the club.

Finsbury Park and District (66, ELFORT ROAD, Highbury, N.).

OCT. 31ST, flying as usual, Finsbury Park, 3 p.m. to dusk.

Monthly Report.—During the past month several members have left for active service, the weekly meetings thereby being somewhat depleted. Model flying by other members has continued, and waterplanes are being taken up by some, including a flying boat by Mr. G. Wren. Mr. B. H. Barnard's Morane tractor waterplane (12 ozs.) has been giving some exhibitions on Highgate Ponds. Land machines have also been flown exceedingly well by Messrs. G. Wren, tractor Morane; A. Richards, tractor mono.; F. Rayner, twin-screw canard (a very stable machine), B. H. Barnard, tractor Morane (mono.); and H. Mullin, tractor Deperdussin. Night flying, with the aid of "sparklers," has also been much in evidence.

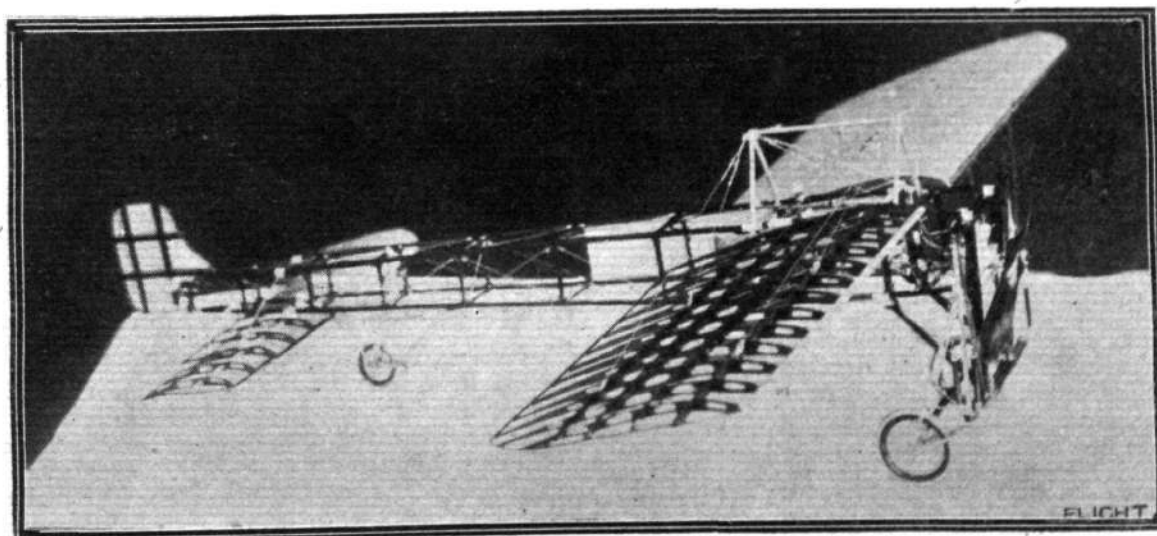


DOVER MODEL AERO CLUB.—Mr. Sargeant's power-driven biplane.

Liverpool Aero Research Club (62, CEDAR GROVE, LIVERPOOL.)

OCT. 31ST at Lister Drive, 3.30 p.m. Nov. 7th at Breckside Park, 3.30 p.m.

Monthly Report.—With October, the second year since the club's commencement opened, and it was fitting that the first meeting at Lister Drive, on the 3rd, should see a contest that was to say the least scientific, yet exciting and full of interest. The event was the second quarter of the "Trophy," for machines fitted with enclosed fuselages, r.o.g. any type. Result being: 1. B. Tear, twin canard monoplane, 43 secs.; 2. T. W. Bennett, twin floating-tail biplane, 28 secs., and G. H. Kilshaw, twin canard monoplane, 28 secs. Although T. W. Bennett (previous holder) did his last flight with a damaged propeller, this nevertheless proved his best, but he was unable to reduce the winner's lead. His machine, which was an excellent piece of work, reminded



DOVER MODEL AERO CLUB.—Mr. Sargeant's model Blériot.

one of the Handley-Page, excepting the propellers. Messrs. Lowe and Connolly timed. Also following with h.l. 1-1-0-P2, L. Shone (ordinary), J. Connolly (negative tip), G. H. Kilshaw (ordinary), F. Lowe (negative tip), and T. W. Bennett, r.o.g. 0-1-1-2P. Oct. 10th at Queen's Drive, Walton, W. Beale, B. Tear (h.l. covered-in fuselage mono.), T. W. Bennett, new backswep negative tip, G. H. Kilshaw "Etrich" canard. Oct. 17th at Sefton Park, T. W. Bennett with the "lost and now returned" backswep h.l. mono. doing a fine high flight, and a duration which must have been a club record, unfortunately not timed and finishing in the middle of the distant lake. G. H. Kilshaw's h.l. back-curved, negative tip mono. fitted with wire-built silk-covered propellers, which seem to act splendidly, enabling the model to climb with ease. Also B. Tear's flying "dove" 1-1-0-2P and J. Connolly. This meet drew a really fine audience. Oct. 24th at Sefton Park, B. Tear making some good flights with "dove" 1-1-0-2P and with h.l. ordinary. E. Kilshaw mastering a very fickle h.l. single-screw (2 member fuselage). J. Connolly with canard racer. It was decided at the meeting held Oct. 14th, that for the purpose of next "Trophy" contest, a tail-behind model, if fitted with an elevator, shall be accepted as a "canard." Members should exert every effort to be ready by date of contest. In barring the too well-known A-frame and single sticks, a decided advance has been made, and the competing designs should be of special interest.

Scottish Ae.S. Model Ae.C. (5, DOUNE QUADRANT, GLASGOW).

OCT. 31st, Paisley Racecourse; train 2.25 Central. Nov. 14th, tractor h.l. competition, for pair of carved propellers, at Paisley Racecourse. Distance and duration. 1 point for every 20 ft. distance, 1 point for every 1 sec. duration. Best average of three attempts. Entry fee 6d. Closing date for entries Nov. 7th.

Monthly Report.—Oct. 17th, at Paisley Racecourse, Mr. G. Pinney, flying a new single-screw h.l., made an official Scottish distance record for this type of 273 feet. Mr. A. M. Muir testing a new twin-screw h.l., getting some very good flights. Mr. Jas. C. Balen was experimenting with his "looper."

S. Eastern Model Ae.C. (154, PECKHAM RYE, S.E.)

USUAL meetings this week-end.

Monthly Report.—Undoubtedly, the outstanding club incident of the month has been the advent of A. B. Clark's tractor monoplane, fitted with a compressed-air motor. Although this model is of rather sturdy construction (it was designed for a steam plant), the engine pulls very well and finds no trouble in averaging 30 secs. duration. Several other engines are now being tuned up, and if the winter is mild enough, it should mark a decided step in the progress of model aviation. Mr. H. H. Groves has re-commenced flying his steam-driven machines, and although the war has somewhat thinned the club's list of active members, the quality and variety of the flying to be seen on Blackheath is still as good as ever. Messrs. F. W. Edwards and W. Entecott have been, and still are, exceedingly energetic, and Messrs. R. W. Prance, G. H. Westwood, A. D. Nicholls, G. Brown, A. F. Chinnery, and F. Plummer have all made flights worth recording. Appended are the rules of the next S.E. Trophy Competition:—*The South Eastern Trophy Competition.* Rules for the Oct-Dec. quarter, 1914.—1. This is a duration competition open to members of the South-Eastern Model Aero Club only, and will be held on Dec. 27th, 1914. 2. It is for twin-propeller rise-off-ground (grass) biplanes, of not less than 6 ozs. in weight. 3. Competitors may adjust their motive power as often as necessary, and must be responsible for all damage done by or to their models. 4. Three official flights will be allowed each entrant, if time permits. 5. Competitors pushing or otherwise assisting their models to rise will be disqualified. 6. The judges will be three non-competitors. 7. These rules may be altered or amended at their discretion. Applications for entry forms and all enquiries with reference to this competition should be addressed to the hon. secretary.

Twickenham and District (74, CLIFFDEN ROAD, TWICKENHAM).
OCT. 31st and Nov. 1st, meeting at the Molesey Rugby Football ground, 5, Cross Road, Twickenham.

Monthly Report.—His Majesty King Manuel has recently consented to honour the club by becoming its Patron. This should do much to urge members on to still further efforts. The truth of this was made evident when last week end saw a full turn out and some really excellent flying. Messrs. Franklyn, Clayton and Rice-Skinner doing 50's with single-prop machines; Mr. Ferry put up, with some twin-screw machines, several good durations, and other members out with many types and various until after dark. During the rest of the month the following members have been flying:—Messrs. Franklyn, Ferry, Foster, Goldring, Maynard, Barnes, Ord, Clayton, Williams, Stagg, Jucker, Rice-Skinner. Mr. Franklyn has had out a 4-oz. tractor with durations of about 40 secs., also with single-propeller machines from 3½ oz. upwards. Mr. Ferry has been out with various twin and single-screw machines, also with compressed-air model, span 5 ft. of the pusher type. The engine, is a Clarke's rotary, driving a 19-inch propeller; the results were satisfactory, but as the trials took place at about 5 a.m. sufficient data could not be gathered. Mr. Jucker has a compressed-air machine, one of Clarke's larger five-cylinder rotaries, which drives a 25-inch propeller giving a 2-lb. thrust, the machine is, in outline a Morane, but it will not, unfortunately, be seen in practice yet awhile as its owner has enlisted. Mr. Goldring has out a very nice little twin-screw T-frame which does about a quarter mile, very fast. Mr. Stagg with a single-screw machine, has got 50 secs. duration and out of sight. He like Mr. Jucker has also enlisted in the Queen's Westminster Rifles. Mr. Maynard has been trying a tractor, as also has Mr. Rice-Skinner, whose tractor's wing had an aspect ratio of 14, the effect of which was distinctly peculiar. The club's flying ground was recently visited twice by the army B.E. stationed at Hounslow Heath. At the indoor meetings this month, competitions were arranged and the dates settled and a new committee elected. The club has suffered considerably owing to about 30 per cent. of its members enlisting.

THE ZEPPELIN SCARE.

DEALING with this subject, Sir Wm. Ramsay, on October 22nd, wrote to *The Times* from Beechcroft, Hazlemere, Bucks, as follows:—

"Reports founded on statements in a book named 'The Secrets of the German War Office' are current that new Zeppelins are to be launched by the Germans containing a gas 15 times lighter than hydrogen, and made of a metal as rigid as steel and three times lighter than aluminium. As regards the first statement, little would be gained by filling an airship with a gas of no weight at all, if such a gas were possible. The buoyancy of a balloon is due

to the replacement of air by a gas, hydrogen, 14½ times as light as air. If the imaginary gas had no weight at all, the buoyant power would be increased only to 15½ instead of 14½.

"As for a metal existing of which the density is only one-third that of aluminium, chemists would agree that it is in the highest degree improbable that such a metal exists. There are excellent reasons for believing that no light metal remains to be discovered.

"That there is a small danger from bombs dropped from Zeppelins cannot be denied. But it would be well that short shrift should be given to any of the crew of a Zeppelin which might be captured after dropping bombs. This is not war; it is murder; and the statutory penalty is death by hanging. If it were generally known that such a penalty were the invariable consequence of being one of a Zeppelin's crew, it might deter men from volunteering on such barbarous adventures."

LONDON IN DARKNESS.

WRITING to the Press from 73, Strand, W.C., on Monday, Mr. Horatio Saqui asks:

"How much longer is the farce of darkening London to continue?"

"The depression of spirits and the effect on nervous people has already resulted in a loss to the community of some hundreds of thousands of pounds, and the casualty lists have grown enormously, more people having been injured or killed by the traffic than ever Zeppelins have accomplished.

"Why do the authorities not encircle London at a distance of, say, Epping Forest with searchlights which should be lighted every night on the look-out for the possible enemy; the men in charge of these searchlights to be in communication by touching a button with all the light works of London, and the men stationed at the searchlights in London itself (which should not be lighted), on the signal being given 'Zeppelins approaching' London could be plunged into total darkness, and simultaneously the central searchlights could play upon the sky; I do not think, in that event, they would get near enough to London to do any damage before they were wiped out of existence.

"What we want is not to discover the enemy when over London, but before they arrive, so as to be prepared to deal with them."

PUBLICATION RECEIVED.

The Flying Book. 1914 Edition. London: Longmans, Green and Co., Paternoster Row. Price 2s. 6d. net.

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Hawkins' Patent Propeller Co., Ltd., 79, Bishopsgate, E.C.—Capital £1,000, in £1 shares. Objects, to carry on the business of marine and aviators' engineers, accessory makers, &c. Under agreement with H. Hawkins, S. H. Hawkins, and J. Rimmer.

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Aeronautical Patents Published.

Applied for in 1913.

Published October 29th, 1914.

20,891. F. M. GREEN. Aeroplane wing structures.
22,566. H. JOYCE. Stay or frame members.

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